Umatilla River Fish Passage Operations Program

Annual Report
2002 - 2003

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Umatilla River Fish Passage Operations Project
Annual Progress Report
October 2002 - September 2003

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TABLE OF CONTENTS

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ABSTRACT

Threemile Falls Dam (Threemile Dam), located near the town of Umatilla, is the major collection and counting point for adult salmonids returning to the Umatilla River. Returning salmon and steelhead were enumerated at Threemile Dam from August 17, 2002 to September 29, 2003. A total of 3,080 summer steelhead (*Oncorhynchus mykiss*); 1716 adult, 617 jack, and 1,709 subjack fall chinook (*O. tshawytscha*); 3,820 adult and 971 jack coho (*O. kisutch*); and 3,607 adult and 135 jack spring chinook (*O. tshawytscha*) were counted. All fish were enumerated at the east bank facility.

Of the fish counted, 6 summer steelhead and 330 adult and 49 jack spring chinook were hauled upstream from Threemile Dam. There were 2,882 summer steelhead; 1161 adult, 509 jack and 1,546 subjack fall chinook; 3,704 adult and 915 jack coho; and 2,406 adult and 31 jack spring chinook either released at, or allowed to volitionally migrate past, Threemile Dam. Also, 109 summer steelhead; 532 adult and 32 jack fall chinook; and 560 adult and 28 jack spring chinook were collected for brood. In addition, 282 spring chinook were collected for the outplanting efforts in the Walla Walla Basin.

The Westland Canal juvenile facility (Westland), located near the town of Echo at rivermile (RM) 27, is the major collection point for outmigrating juvenile salmonids and steelhead kelts. The canal was open for 159 days between January 27 and July 4, 2003. During that period, fish were bypassed back to the river 145 days and were trapped 11 days. An estimated 205 pounds of juvenile fish were transported from Westland to the Umatilla River boat ramp (RM 0.5). Approximately 82% of the juveniles transported were salmonids. No steelhead kelts were hauled from Westland this year.

The Threemile Dam west bank juvenile bypass was opened on September 16, 2002. and continued until November 1, 2002. The bypass was reopened March 3, 2003 and ran until July 3, 2003. The juvenile trap was operated by the Umatilla Passage Evaluation Project.

INTRODUCTION

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and Oregon Department of Fish and Wildlife (ODFW) are cooperatively working to rehabilitate runs of coho, fall and spring chinook and summer steelhead in the Umatilla River Basin (Figure 1). The Bonneville Power Administration (BPA) and other federal agencies are funding several projects to accomplish that goal (CTUIR, et al. 2001). Included among these projects is Umatilla River Fish Passage Operations (formerly known as Trap and Haul, project number 198802200).

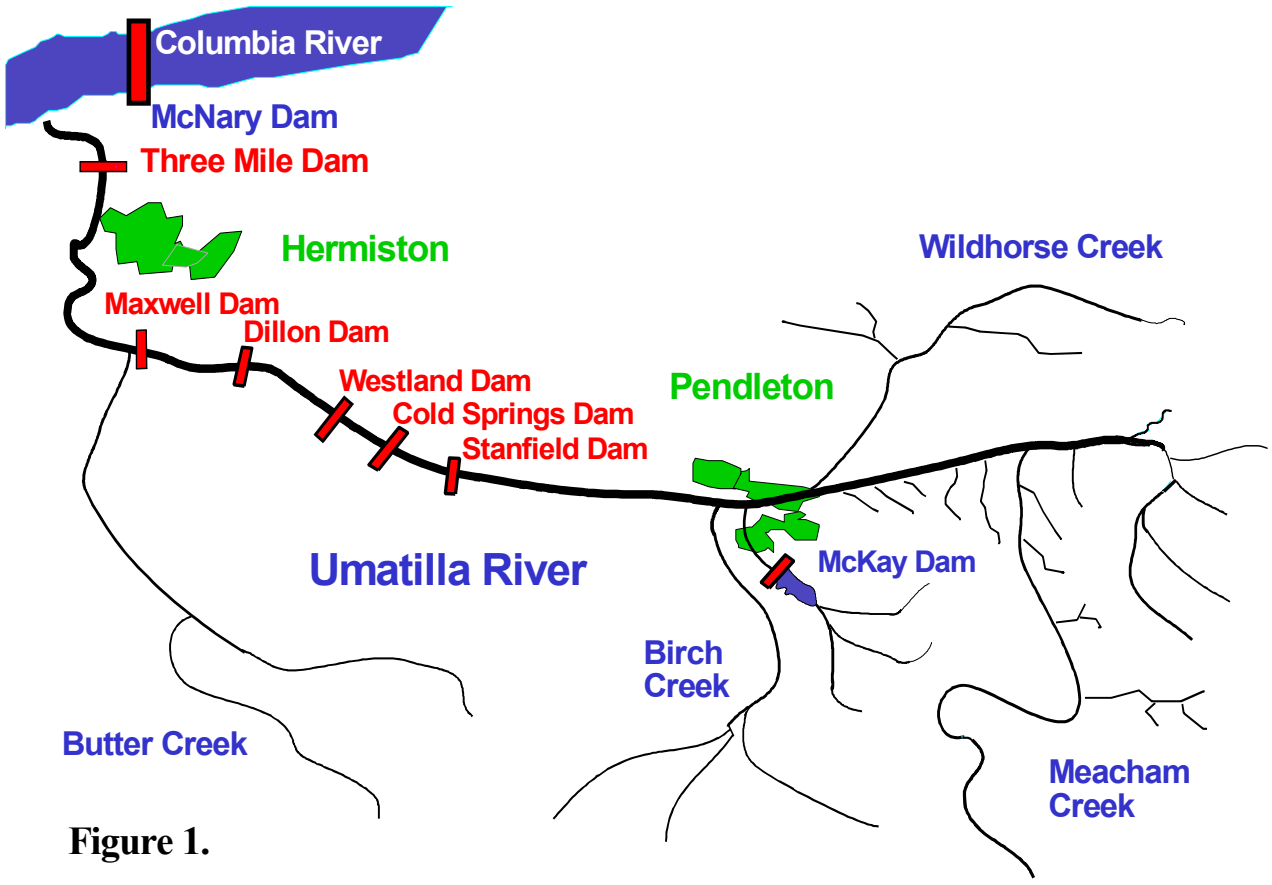

Figure 1.

The lower 32 miles of the Umatilla River historically provided obstacles to the migration of both adult and juvenile salmonids. Passage inadequacies have been identified as a major contributor to the decline of summer steelhead and extinction of salmon populations in the basin (CTUIR, et al. 2001, CTUIR & ODFW 1989, CTUIR & ODFW 1990, ODFW 1986). During both juvenile and adult migration periods, parts of the lower river between the mouth and Stanfield Dam were dewatered, stranding migrating salmonids. The U.S. Fish and Wildlife Service (USFWS)(1981) and U.S. Bureau of Reclamation (BOR)(1988) identified flows ranging from 150 cubic feet per second (cfs) to

300 cfs as being necessary for fish passage through this river reach. With implementation of the Umatilla Basin Project, the duration and extent of these low flow periods have decreased substantially from what occurred historically.

In addition to low flows, diversion structures associated with irrigation canals also provided physical barriers to passage. Adult ladder and juvenile screen and bypass improvements have been completed at most diversions in the basin. With implementation of these flow enhancement and physical passage improvements, passage conditions have improved dramatically. However, even with these improvements in place there are still periods when inadequate passage conditions may occur.

Initially, this project was implemented as the Umatilla River Trap and Haul project in 1989. The primary responsibility of the project through the early years was to capture and safely transport adult and juvenile migrants around dewatered stream reaches in the lower basin. The project has evolved with implementation of the flow enhancement and fish passage improvements in the basin. The project title changed to the Umatilla River Fish Passage Operations in 1999 to more accurately reflect the transformations which have occurred within the project and in the overall passage program in the basin. While transportation is still an important function, operation and coordination of flow enhancement efforts and passage facilities are now the major focus for the project.

The objective of the Umatilla River Fish Passage Operations Project is to maximize survival of adult and juvenile salmonids migrating through the lower Umatilla River. The project has four primary areas of responsibility to meet this objective: 1) Monitoring of flow and passage conditions in the basin; 2) Daily operation and refinement of operating criteria for passage and trapping facilities, and transportation equipment; 3) Oversight of the flow enhancement effort (Umatilla Basin Project); and 4) Coordination of the overall fish passage program. It is critical that facility operations and flow enhancement efforts are coordinated with passage requirements to ensure that optimal passage conditions exist and passage inadequacies are no longer a limiting factor to restoration efforts in the basin.

METHODS

Objective 1 - Passage Conditions Monitoring

Task 1.1 - Monitoring of River Conditions

Temperatures are monitored during the project year to help refine project operating guidelines. Temperatures for the lower Umatilla River are measured by a digital recording thermometer located at the UMAO hydromet site (RM 2). Instantaneous temperatures are measured daily at Threemile Dam during trapping operations and at loading stations and release sites with hand held thermometers.

Daily river flow is monitored at Pendleton (RM 54), Yoakum (RM 37), Dillon (RM 24.5) and Umatilla (RM 2). Daily irrigation usage is monitored for Stanfield, Westland, Feed, and West Extension canals. River flow and irrigation diversion data is provided by Oregon Department of Water Resources (OWRD) from the Hydromet flow gauging stations.

Task 1.2 - Inspection of Passage Facilities

Juvenile fish screens/bypasses and adult ladder facilities, associated with irrigation diversions within the basin, are monitored throughout the year to ensure that adequate passage conditions exist for upstream and downstream migrants. Inspections include checking for proper installation and operation of screens, gaps and holes in screens or seals, debris buildup on screens and trash racks, proper flows to smolt bypasses and adult ladders, adequate access and exit conditions at bypasses and ladders, and signs of fish activity.

Objective 2 - Operation of Adult Trapping Facilities

Task 2.1 - Threemile Dam Adult Trapping

Threemile Dam, located approximately three miles upstream from the mouth of the Umatilla River, is the major collection and counting point for all adults returning to the Umatilla River. The main collection facility is located on the east bank and includes a vertical slot ladder, Denil steeppass, raceway type holding pond and fish handling and sorting complex (Figure 2). Fish routed through the sorting complex are anesthetized with carbon dioxide (CO_2) to reduce stress during the handling process. Captured adults can be directed back into the holding pond, into recovery tanks for release upstream of the dam, to a broodstock holding and spawning facility, directly into the dam forebay, or into transport tanks for hauling.

Figure 2.

Up until the 1999/2000 return year, all adults returning to Threemile Dam were trapped. That year, criteria were outlined for volitional migration of adults past Threemile Dam with enumeration occurring through video recording. For the past three years, the Umatilla Hatchery and Basin Annual Operations Plan (AOP)(CTUIR & ODFW 2002) has identified criteria for volitional migration of adults past Threemile Dam. For 2002/2003, the AOP outlined that beginning December 1, trapping was to be reduced to five day periods with volitional migration occurring for nine day periods. As of April 15, trapping was to be reduced even more, to an as needed basis for collection of spring chinook broodstock. Trapping periods would be increased if broodstock collection goals or passage criteria were not being met.

Data collected during adult trapping operations includes date, number of fish trapped, species, age and sex composition, marks and disposition. Observations are also made of marine mammal damage, net marks, mechanical damage, and general fish condition. In addition, fork length, mid-eye/hypural plate (MEHP) length, and snouts are collected from a percentage of the fish with coded wire tags (CWT). During volitional migration periods, enumeration occurred by video camera. Data collected during volitional migration includes date, species, number of fish moving upstream and downstream, jack or adult salmon, and wild or hatchery steelhead. General observations were also made such as time of movement and other species observed.

Fall and spring chinook salmon were classified as either adults (fork length greater than or equal to 24 inches) or jacks (fork length less than 24 inches) as outlined in ODFW sport fishing regulations. Subjack (or mini-jack) fall chinook were defined as less than 15.75 inches in fork length based upon historical length frequency data (CTUIR files). Coho adults were defined as fork length greater than or equal to 18 inches and jacks as fork length less than 18 inches based upon historical length frequency data (CTUIR files). Based on scale analysis of Umatilla River summer steelhead, adult summer steelhead were classified as either one ocean (S1, fork length less than 26 inches) or two ocean (S2, fork length greater than or equal to 26 inches) (CTUIR files). Visual determinations are made to differentiate resident rainbow trout from summer steelhead (but generally less than 18 inches). No data are collected from fish designated as resident trout.

The east bank facility is manned 24 hours a day during the adult capture season. Permanent, on-site housing is provided for watch personnel. In addition to providing security, watch personnel monitor facility operations, assist trap and haul operations, and make observations of fish activity.

The west bank at Threemile Dam also has an adult collection facility. It consists of a vertical slot ladder, a combination V-trap/holding pond, and fish loading apparatus. The trap/holding pond and fish loading complex have no enumeration or sorting capabilities. The ladder was designed with the ability to enumerate fish using video equipment.

Task 2.2 - Westland Adult Trapping

Summer steelhead kelts may be captured at the Westland Canal juvenile facility during trapping operations. The facility has the ability to bypass kelts downriver during high flows or to trap them for transport during low flow periods. It is generally operated in the bypass mode during the majority of the kelt outmigration period. Other adults (such as spring chinook) may also be captured incidentally at the facility during trapping operations and are held for transport upstream. Information collected from adults trapped at Westland includes date, species, and number.

Objective 3 - Operation of Juvenile Trapping Facilities

Task 3.1 - Westland Juvenile Facility Operation

The Westland Canal juvenile facility (Figure 3) is the major collection point for outmigrating juvenile salmonids. It is intended to be operated whenever Westland Canal is delivering water. The facility consists of rotary drum screens, fish bypass, fish trap, adult/juvenile separator (horizontal bar grader), and adult and juvenile holding ponds.

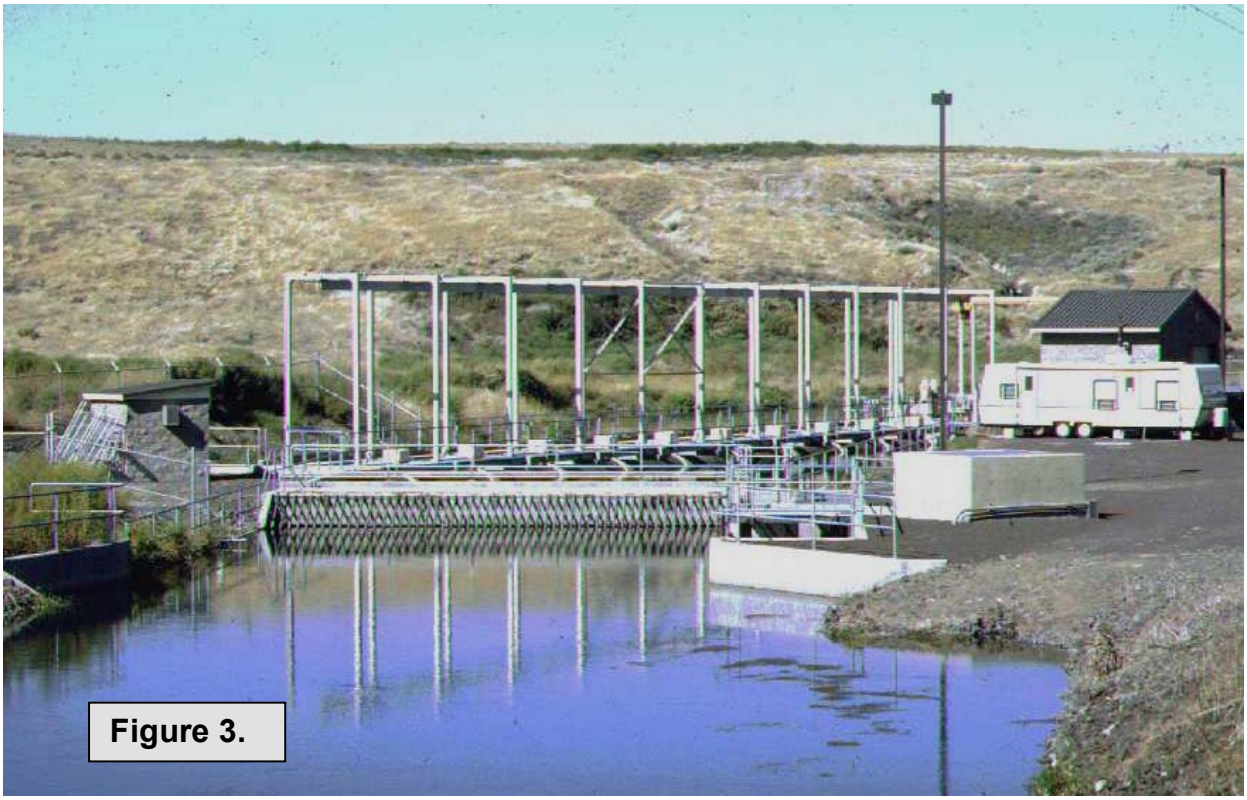

Figure 3.

During periods of flow adequate for downstream migration, the facility is designed to operate in the bypass mode. In this mode, fish that enter the irrigation canal are directed back to the river without entering the holding ponds. During periods of inadequate flow, the facility is designed to trap fish, separate juveniles from adults, and direct them to their respective holding units. Juveniles can then be loaded onto trucks or trailers for transport downstream.

Facility trapping operations are coordinated with flow augmentation releases. As river flows drop, the Westland ladder is closed and as much of the river flow as possible is diverted into the Westland Canal headworks and through the juvenile facility prior to being returned to the river. This forces outmigrants into the trapping facility and minimizes the number of fish that may become stranded in the low flow river reach below Westland Dam.

Information collected at Westland includes dates of both canal operation and facility operational modes. Because the majority of the fish are now bypassed at Westland rather than trapped, the facility is no longer manned on a 24 hour basis.

Task 3.2 - Threemile Dam Juvenile Facility Operation

A juvenile collection facility is also located at Threemile Dam on the west bank. This facility consists of rotary drum screens, fish bypass channel, fish trap, sampling station and holding tank. It is designed to bypass outmigrating juveniles during periods of adequate

flow or to trap them during low flow periods. The trapping portion of this facility was designed as a sampling and evaluation station rather than a production trapping facility. The trap can be used for sampling during bypass periods but is ineffective for trapping and hauling anything but small numbers of fish.

Because of the insufficient trapping capabilities at this site, the operation of the facility is closely coordinated with the Westland facility in order to minimize the number of fish captured at Threemile Dam. Normally, the entire river flow is diverted at Westland to preclude additional downstream volitional movement for a few days prior to the river flow going to zero. This allows smolts located in the reach between Westland and Threemile dams to be bypassed at Threemile Dam prior to trapping being initiated.

Information collected at Threemile Dam west bank includes dates of both canal operation and facility operational modes. The facility is not manned on a 24 hour basis.

Objective 4 - Adult and Juvenile Transportation

Task 4.1 - Threemile Dam Adult Hauling

The Fish Passage Operations program has a 3,500 gallon, one 3000, and two 370 gallon fish liberation units available for use. The 3,500 gallon unit is a diesel operated tractor- trailer equipped with a 12 inch discharge opening and a single holding chamber. The 3,000 gallon unit is a diesel operated tractor-trailer equipped with a 12 inch discharge opening and two holding chambers capable of isolating two groups in the same load. Both tractor-trailer units are equipped with liquid oxygen and electric aeration to reduce fish stress during transport. The two 370 gallon transport tanks are mounted on dual axle trailers and are pulled by pick-up trucks. Each is equipped with both compressed oxygen aeration and a re-circulation system. Both units have an eight inch discharge opening. These transportation units are used in the Umatilla and Walla Walla basins. ODFW liberation protocols are used as the basic guideline for hauling operations.

In addition to these units, the project also has access to a Bureau of Indian Affairs 750 gallon portable fiberglass tank which can be mounted on a flatbed truck. This unit is also equipped with both compressed oxygen aeration and a re-circulation system and has a 12 inch discharge opening.

Adult transportation requirements are based on flow criteria outlined in the 1981 USFWS study and past project observations of salmon migrations in the Umatilla River. The AOP also identifies criteria for transportation of adults collected at Threemile Dam. Generally, returning adults are to be hauled whenever flows in the Umatilla River are projected to fall below 150 cfs at Dillon within 30 days. The project is also responsible for the collection and transportation of broodstock from Threemile Dam.

The AOP outlines release locations for spring chinook and steelhead adults hauled

upstream from Threemile Dam. Fish are to be released at either the Pendleton boat ramp (RM 52.5) or Pendleton juvenile acclimation site (RM 56) unless flows at Pendleton drop below 250 cfs. Releases are then to be made as high in the basin as temperature differentials will allow. Summer steelhead releases are to be alternated between the various upriver release locations. It is not anticipated that fall chinook or coho would be hauled from Threemile Dam, so no release sites were identified

Returning adults are to be released at Threemile Dam whenever flows at Dillon are anticipated to remain above 150 cfs for a minimum of 30 days after release. Now that the UBP flow enhancement program is in place, flows generally remain above 150 cfs for all but the very beginning and end of the adult return season. The majority of adults entering the Umatilla River are either released at, or volitionally migrate past, Threemile Dam. The AOP identified the following groups for release at Threemile Dam regardless of flow condition; fall chinook minijacks and excess fall chinook jacks, coho adults, and coho jacks.

Task 4.2 - Westland Adult Hauling

Summer steelhead kelts and other adults may be captured at the Westland Canal juvenile facility during trapping operations. Adults entering the trap can be separated from juveniles by a horizontal bar grader and directed into an adult holding pond. Kelts can then be loaded onto tanks for hauling downstream for release at the Umatilla River boat ramp. Other adults captured incidentally at Westland, such as spring chinook, are hauled upstream to natural production areas.

Task 4.3 - Westland Juvenile Hauling

With the Umatilla Basin Project (UBP) flow enhancement program in place, spring flows are usually high enough that most juveniles are bypassed at Westland. Trapping only occurs at the very end of the outmigration season and the biomass of juveniles captured is very low. During periods when these low numbers of fish are being captured, the fish are manually loaded onto the transport trailers by dipnet.

Juvenile trapping and transportation requirements are based on flow criteria from the 1981 USFWS study and past observations of juvenile outmigration in the Umatilla River. Downstream migrants are generally trapped and hauled beginning when enhancement flows are tapered off.

The same transport units used for adults are used for hauling juveniles. ODFW liberation protocols are also used as the basic guideline for juvenile hauling operations. Data collected for each transport includes date, transport unit, number of pounds hauled, and an estimate of mortality. Umatilla Hatchery Satellite Facility personnel collect information related to smolt outmigration such as size and species composition. All juveniles are to be released at the Umatilla River boat ramp.

Task 4.4 - Threemile Dam Juvenile Hauling

The capability exists at the Threemile Dam west bank juvenile facility to trap and haul only small numbers of outmigrants. Fish are to be hauled when Phase I exchange flows and flow augmentation efforts are discontinued. If coordinated with trap operations at Westland Canal, few smolts are present above Threemile Dam when trapping operations begin. Any juveniles hauled from the facility are released at the Umatilla River boat ramp.

Task 4.5 - Other Hauling Operations

Fish Passage Operations personnel and equipment are available for other transportation needs related to the Umatilla Basin fisheries restoration program as long as project priorities do not preclude participation. It has become an annual practice for the project to haul excess fall chinook adults from Priest Rapids and/or Ringold Springs hatcheries to the Umatilla River for natural spawning augmentation. The AOP has identified up to 1,000 adults for transfer with releases to occur at Yoakum (RM 37) and/or the Pendleton juvenile acclimation site (RM 56).

Objective 5 – Coordination of Passage Program

Task 5.1 – Passage Facility Operation and Maintenance Oversight

The physical passage portion of the program includes juvenile fish screens, bypasses, and adult ladders. Operation of passage facilities are coordinated with the Umatilla Basin Fish Facility Operation and Maintenance crews using criteria developed by National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries – formerly National Marine Fisheries Service) as a general guideline for facility operations.

Task 5.2 – Management of McKay Fish Flow Releases

As part of the (UBP) Phase II exchange program, a portion of the water stored in McKay Reservoir is designated for fish enhancement purposes. In the spring, OWRD and BOR produce a “Beginning Storage Report” for McKay Reservoir which identifies the amount of water available in the reservoir for fisheries uses for that specific year. The project then allocates the release of this water using the timing and flow quantity prioritization guidelines outlined in the AOP.

Task 5.3 – Coordination of Exchange Program

There are two components of the fish passage program in the lower Umatilla River; flow enhancement and physical passage facilities. It is essential that operation of these components is coordinated with river conditions and diversion activities in order to maximize lower river migration conditions.

The (UBP) flow enhancement program has two components. Phase I of the UBP is comprised of a live flow exchange with West Extension Irrigation District (WEID). Phase II of the UBP has three individual components; live flow exchanges with both Hermiston

(HID) and Stanfield (SID) irrigation districts and a reservoir storage exchange with SID. In all components of the UBP, Columbia River water is pumped from the McNary pool to the affected irrigation district in "exchange" for that district leaving natural Umatilla River flow instream.

Operation of this complex exchange program is coordinated by the project in conjunction with other CTUIR and ODFW staff, BOR, OWRD, and the affected irrigation districts. Criteria for operation of the flow enhancement program is based on a combination of project observations of adult and juvenile migration, UBP target flows (BOR 1988), and USFWS (1981) minimum flow recommendations.

RESULTS

Objective 1 - Passage Conditions Monitoring

Task 1.1 - Monitoring of River Conditions

Water temperature and flow, measured at the Umatilla gauging station, exhibited extreme seasonal variation throughout the project year. The lowest daily temperature recorded was 2.9 C (37.3 F) on November 2, 2002. The highest daily temperature was 38.6 C (78.3 F) on July 23, 2003. Flows at the Umatilla gauging station ranged from less than 2 cfs in July to 4,663 cfs in late January.

Umatilla River flows at Dillon are affected by McKay Reservoir storage releases, irrigation withdrawals and natural flows. Flows at Dillon ranged from a low of less than 3 cfs in August to a high of 4,980 cfs in late January. Flows at Yoakum ranged from 90 to 5286 cfs and flows at Pendleton ranged from 24 to 4571 cfs. Flow and temperature information for the project year is contained in Appendix A.

Task 1.2 - Inspection of Passage Facilities

Four main operational concerns were observed during monitoring of the juvenile and adult passage facilities; aquatic vegetation growth in the canals, gravel and debris deposition at the facilities, operational issues at the Threemile Dam west bank juvenile facility and canal headgate operation coordination. A number of smaller problems were also noticed and corrected at the various sites.

Objective 2 - Operation of Adult Trapping Facilities

Task 2.1 - Threemile Dam Adult Trapping

Threemile Dam east bank ladder and adult facility was opened for the season on August 16,2002 in conjunction with the start up of Phase I. During the project year, the ladder had to be closed down on two instances. It was off from January 27 – 28, 2003 and again from January 30 – February 3, 2003 because of large amounts of organic debris in the river.

Starting December 6, 2002, the adult facility was generally closed for nine day periods followed by five days of trapping. The schedule was modified based on broodstock and data needs. During the periods when the adult facility was closed, the lead gate was pulled from the ladder in order to allow volitional upstream migration of adults and enumeration occurred by video counting. The adult facility was operated at this schedule until June 2, 2003 when full time trapping was restarted so adults could be transported upriver as per passage criteria. The ladder and adult facility was closed for the summer on July 7, 2003.

The first returning salmon and steelhead were enumerated on August 27, 2002. A total of 3,080 summer steelhead; 1,716 adult, 617 jack and 1703 subjack fall chinook; 3,820 adult and 971 jack coho; and 3,607 adult and 135 jack spring chinook were counted at Threemile Dam. Included in the spring chinook total are 6 adults captured after the trap was reopened for the fall. In addition, there were 31 summer steelhead trapped that were designated as 2004 brood which will be included in the 2003/04 return summary. There were also an estimated 270 precocious spring chinook juveniles captured in the adult trap at Threemile Dam between June 24 and August 27, 2003. In addition, 15 precocious spring chinook juveniles were salvaged from the ladder during the dewatering on July 7. These fish were not included in the spring chinook return figures.

Of the adult returns, 1502 summer steelhead; 5 adult, 1 jack, and 2 subjack fall chinook; 68 adult and one jack coho; and 1451 adult and 5 jack spring chinook were counted by video as they passed through the east bank ladder. All other adults were enumerated during trapping operations at the east bank adult facility. The west bank adult facility was not operated again this year. Appendix B contains a daily record of adults enumerated during 2002-2003.

Summer steelhead were enumerated from June 12, 2002 to May 10, 2003. The peak return occurred during February when 37.5% (1,157 of 3,080 fish) of the total return was counted. Approximately 61% of the run were estimated to be unmarked fish. Based on historical fork length data, 39% of the summer steelhead run was comprised of S1 fish and 61% were S2 fish.

Coho were enumerated from September 3, 2002 to January 17, 2003. Peak return month for both adults and jacks was November when 81% (3101 of 3820 fish) of the adults and 47% (459 of 971 fish) of the jacks were counted.

Fall chinook were enumerated from September 3, 2002 to January 30, 2003. Peak return month for adults, jacks, and subjacks was October. Of the total return, 54% (933 of 1,716 fish) of the adults, 63% (390 of 617 fish) of the jacks and 76% (1,306 of 1,709 fish) of the subjacks were counted in October.

Spring chinook were enumerated from March 27 to September 29, 2003. Peak month for adults was May when 54% (1963 of 3607 fish) and June for jacks when 58% (79 of 135 fish) were counted.

In addition to capturing adult salmonids, thousands of non-game fish were collected at the east bank facility during trapping operations. Major species collected were northern pikeminnow (*Ptychocheilus oregonensis*), chiselmouth (*Acrocheilus alutaceus*), and suckers (*Catostomus spp.*). Northern pikeminnows were sacrificed; all other non-game fish were released upstream of the dam. Juvenile salmonids and rainbow trout also entered the adult trap and were released back to the river. Other species encountered at Threemile Dam included pacific lamprey (*Lampetra tridentata*), carp (*Cyprinus carpio*), smallmouth bass (*Micropterus dolomieui*), and whitefish (*Prosopium williamsoni*).

Task 2.2 - Westland Adult Trapping

No adult salmonids were captured at Westland this year.

Objective 3 - Operation of Juvenile Trapping Facilities

Task 3.1 - Westland Juvenile Facility Operation

Westland Canal was in operation for a total of 159 days between January 27 and July 4, 2003. The juvenile facility operated in the bypass mode for 145 days and in the trapping mode for 11 days. There were also three days when fish were directed into and held in the canal forebay between the time the bypass was closed and the trap opened. This occurred during the period when the fish passage flows were being tapered down.

Westland Canal opened for groundwater recharge deliveries on January 27, 2003 and switched from winter recharge to standard irrigation delivery in mid March. Natural and enhanced river flow levels were adequate to continue operation of the juvenile bypass for downstream migration until July 4 when it was closed as fish passage flows were tapered off for the summer. The juvenile trap was opened on July 6 and hauling began on July 7. Trap and haul operations continued until the facility was closed on July 18.

Flow enhancement releases from McKay Reservoir resulted in relatively low numbers of juvenile salmonids being captured at the Westland facility in 2003. Non-game and warmwater fish were also collected at Westland, major species included northern pikeminnow, chiselmouth, suckers, and redside shiner (*Richardsonius balteatus*).

Task 3.2 - Threemile Dam Juvenile Facility Operation

The Threemile Dam west bank juvenile bypass ran continuously through the summer of 2002. The canal discontinued irrigation deliveries on November 1 and the headworks and bypass were closed for off-season canal maintenance. The bypass operated at the 5 cfs level the entire period.

The headworks and bypass were re-opened on March 3, 2002 for outmigration evaluation monitoring. The canal actually began irrigation deliveries on March 18. The juvenile bypass operated at 5 cfs throughout the spring until it was closed for the summer on July 3. The juvenile trap was operated for outmigration sampling by Umatilla Passage Evaluation personnel the entire season.

Task 4 - Adult and Juvenile Transportation

Task 4.1 - Threemile Dam Adult Hauling

Upstream transportation of spring chinook and summer steelhead from Threemile Dam began on June 2, 2003. There were a total of 338 adult and 49 jack spring chinook

and 29 2004 brood summer steelhead hauled upstream this year. No fall chinook or coho were hauled again this year.

There were 532 adult and 32 jack fall chinook transferred to the Threemile Dam Fall Chinook Holding and Spawning Facility for broodstock. In addition, 109 summer steelhead were hauled to Minthorn for brood and 560 adult and 28 jack spring chinook were transported to the South Fork Walla Walla Spring Chinook Holding and Spawning Facility for brood. There were also 281 adult and one jack spring chinook that were hauled to the South Fork facility for outplanting into the Walla Walla River.

There were 88 loads of fish transported by the project from Threemile Dam on 87 days during 2002/2003. The 3,000 gallon tanker was used for 38 trips, one of the 370 gallon trailer units was used for 39 trips, and the 750 gallon flatbed mounted tank for 11 trips. There were five double haul trips made this year, all with the tanker.

Summer steelhead adults were hauled upstream from Threemile Dam on 8 days between June 12 and July 8 2003. There were also 27 trips made to Minthorn holding pond with brood between October 1, 2002 and April 11, 2003. Spring chinook were hauled upstream from Threemile Dam 29 days between June 2 to September 29, 2003. There were also trips made to the South Fork facility on 37 days between April 21 and June 10 with spring chinook broodstock and adults for Walla Walla River outplanting.

Two upriver release sites were used during 2002/2003, Thornhollow (RM 73.5), and Bear Creek (RM 87). Adult transport information, including dates, temperatures, liberation units used and release sites is included in Appendix C.

There were 1,380 summer steelhead; 1156 adult, 508 jack and 1,544 subjack fall chinook; 3,636 adult and 914 jack coho; and 947 adult and 26 jack spring chinook trapped that were subsequently released into the forebay at Threemile Dam. In addition, 1502 steelhead; five adult, one jack, and 2 subjack fall chinook; 68 adult and 1 jack coho; and 1451 adult and 5 jack spring chinook volitionally migrated upstream through the east bank fish ladder.

Summer steelhead adults were trapped and released into the forebay at Threemile Dam on 106 days between August 20, 2002 and May 10, 2003. Fall chinook were released at Threemile Dam on 74 days between September 3, 2002 and January 30, 2003. Coho were released at Threemile Dam on 77 days between September 3, 2002 and January 17, 2003. Spring chinook were released at Threemile Dam on 36 days between March 27 and June 1, 2003.

Volitional migration occurred on a regular schedule from December 6, 2002 to May 18, 2003. Summer steelhead were counted volitionally passing the Threemile Dam ladder on 74 days between December 7, 2002 to May 18, 2003. Fall chinook volitionally passed through the Threemile Dam ladder on 4 days between December 11 to December 15. Coho volitionally passed through the Threemile Dam ladder on 3 days between December 13 and December 15. Spring chinook were counted volitionally passing the Threemile

Dam ladder on 27 days between March 30 and May 18, 2003. Table 1 includes release location and number by species.

Table 1. Number of Adults Released at each location in 2002-2003.

Release Site	Total Released	Summer Steelhead	Spring Chinook	Fall Chinook	Coho
Bear Creek	263	27	236	0	0
Thornhollow	153	2	151	0	0
SFWW Brood Pond	588	0	588	0	0
SFWW Outplants	282	0	282	0	0
Minthorn Brood Pond	109	109	0	0	0
3MD Brood Pond	564	0	0	564	0
3MD Forebay – Volitional	3,035	1,502	1,456	8	69
3MD Forebay – Trapped	10,111	1,380	973	3208	4,550
Total	15,105	3,020	3686	3,780	4,619

Task 4.2 - Westland Adult Hauling

No summer steelhead kelts or spring chinook fallbacks were hauled from Westland this year.

Task 4.3 - Westland Juvenile Hauling

McKay water releases through the spring and into the early summer limited the number of juveniles captured at Westland in 2003. The project hauled six loads of juveniles from Westland on six days between July 7 and July 18, 2003. One of the 370 gallon liberation units was used for all the loads. An estimated 205 pounds of fish were hauled from the facility. All juveniles hauled from Westland were released at the Umatilla River boat ramp (RM 0.5). Juvenile transportation information is located in Appendix D.

Based on species composition sampling conducted by Umatilla Hatchery Satellite Facility personnel, approximately 82% of the fish transported from Westland were juvenile salmonids. Species composition information is included in Table 2.

Table 2. Species composition of fish sampled at Westland in 2001.

Date	Number Sampled	No/lb	Hatchery Production			Natural Production			Other
			Coho	Chinook	STS	Coho	Chinook	STS	
7-07	208	28.8	0	25	0	8	114	20	41
7-09	460	8.6	0	65	0	13	233	36	113
7-11	203	17.2	0	19	0	10	127	22	25
7-14	167	17.9	0	24	1	8	99	19	16
7-18	95	17.8	0	4	0	0	62	7	19
Total	1,133	----	0	137	1	42	635	104	214

Task 4.4 - Threemile Dam Juvenile Hauling

No juveniles were trapped and hauled from the Threemile Dam west bank juvenile facility during the project year. The Umatilla Passage Evaluation project operated the facility all year and transported all juveniles trapped during this period.

Task 4.5 - Other Hauling Operations

In the fall of 2002, the project hauled excess fall chinook adults to the Umatilla River for natural spawning augmentation. The project transported 859 adult fall chinook from Ringold Springs Hatchery and released them directly into the Umatilla River at Yoakum (RM 37). The fish were hauled in five trips between October 31 and November 15, 2002. There were an estimated 4 mortalities observed from the Ringold releases. In addition, there were 122 excess fall chinook broodstock hauled from Threemile Dam and released into the Umatilla River on November 19. All trips were made using the 3,000 gallon tanker unit.

The project was also involved in the Walla Walla spring chinook outplanting program. The project hauled adults from both Ringold Springs and Threemile Dam to the South Fork facility and subsequently outplanted the survivors. Transport information for the efforts listed in this section is included in Appendices C and D.

Objective 5 – Coordination of Passage Program

Task 5.1 – Passage Facility Operation and Maintenance Oversight

The project coordinated with Umatilla Basin Fish Facility Operations and Maintenance personnel on both daily operations and facility maintenance of ladder and screens sites throughout the project year.

Task 5.2 – Management of McKay Fish Flow Releases

As part of the Umatilla Basin Project (UBP) Phase II exchange program, a portion of the water stored in McKay Reservoir is designated for fish enhancement purposes. Releases of fish storage water began on August 22, 2002 in conjunction with irrigation storage releases being discontinued. Flows were initiated at 75 cfs and increased to 100 cfs on September 20. Releases remained at that level until October 4. Flows were then increased to 110 cfs and tapered down starting November 19. Storage releases were tapered down to a winter release of 10 cfs. Storage water is released into lower McKay Creek throughout the winter and spring as needed to maintain minimum flow level of 10 cfs to sustain juvenile production in the lower McKay Creek.

In the spring, fish storage releases were started May 29, 2003. The quantity released was determined by the amount needed, in conjunction with live flow exchanges, to maintain a minimum of 150 cfs at the Dillon gauge. The release level was tapered down

to 100 cfs on June 29 and tapered off beginning July 4. Fish water releases from McKay Reservoir were discontinued on July 7.

Task 5.3 – Coordination of Exchange Program

Phase I of the UBP was started August 16, 2002 to increase flows for returning fall adult salmonids. It operated until October 30 when the exchange with WEID was discontinued in conjunction with the end of the WEID irrigation season. The exchange restarted May 20, 2002 and operated as needed to maintain UBP target flows until July 1 when exchanges were discontinued for the summer.

The Phase II exchange with HID began November 2, 2002 and ran off and on as needed to maintain UBP target flows until April 14, 2003. The SID Phase II exchange was initiated May 20. Initially, water was pumped to SID in exchange for live flow. Pumping continued through the summer in exchange for SID storage water in McKay Reservoir to be used for fish passage releases.

DISCUSSION

Task 1 - Passage Conditions Monitoring

Task 1.1 - Monitoring of River Conditions

A temperature recorder has been in place at the Umatilla Hydromet gauging station since the fall of 2001. In the past two years, the reliability of the new temperature recorder station has eliminated the concerns associated with the field recorder at Threemile Dam. Due to the limited amount of water available, flows were not continuous to the mouth from Threemile Dam. The high temperatures in the summer at the gauging station may reflect stagnant water conditions in the lower Umatilla River.

The accuracy and timeliness of flow data from the Hydromet gauging stations continues to be sufficient for most passage decisions. Rating of the gauging stations were performed in a timely manner. Gauging stations were generally rated prior to the initiation of McKay storage releases making it easier to follow protected enhancement flows.

The Dillon gauge site continues to be the most important location for making fish passage decisions. Due to the fact, that Dillon is located downstream of the major diversions and at what is generally the low flow point of the river. Decisions of when to implement UBP exchanges, when to augment stream flows for passage, whether to trap or bypass smolts, where to release adults, how to operate fish passage facilities, and at what flows adults and juveniles can effectively migrate are all made based on information from this gauging station. The number and location of the Hydromet gauging stations is adequate for most exchange and fish passage decisions.

Task 1.2 - Inspection of Passage Facilities

Four main operational concerns were observed during monitoring of the juvenile and adult passage facilities; aquatic vegetation growth in Maxwell and Stanfield Canals, gravel and debris deposition at the facilities, operational issues at the Threemile Dam west bank juvenile facility and canal headgate operation coordination. A number of smaller problems were also noticed and corrected at the various sites.

Aquatic vegetation in Maxwell Canal continues to be a major problem for both HID and fish passage. The district has discontinued use of aquatic herbicides upstream of the screens and has to rely on mechanical means to contain this growth which is not nearly as efficient. The canal became choked with weeds to a point where flows could not be maintained. The bypass is located approximately one mile from the headworks, there are concerns with the time and distance smolts have to travel to reach the bypass. Low velocities intensify these concerns. Also, the canal elevation could not be maintained which precluded operation of the bypass and resulted in the screens operating well below submergence criteria during the summer of 2003.

In addition, Maxwell canal headgates were opened by vandals on January 6 and were closed the morning of January 7. The fish screens were raised for winter maintenance and canal check gates were open, which allowed the water to flow through the canal until the trash rack plugged full of debris forcing the water to exit via the wasteway upstream of the fish screens. Security is definitely an issue at all passage facilities and installing a fenced enclosure around the headgates would eliminate immediate access to vandals at the site.

High flows during late January and early February deposited large amounts of gravel and debris at a most of the passage facilities. This resulted in most of the ladders being shut down for short durations in order to remove debris and gravel. The Umatilla Basin Fish Facility Operations and Maintenance personnel responded to these instances in a timely manner, limiting the amount of time the facilities had to be shut down.

There were a significant number of summer steelhead observed holding in a shallow pool, which forms on the deck of the Feed Canal diversion dam below the flashboards in February. A combination of the dam flash boards in and high water resulted in the accumulation of gravel and debris in the vicinity around the diversion and ladder causing the flow to be directed across the face of the dam and decreased the flow in the immediate area of the fish ladder. The ladder entrance gate operation was changed from criteria, to increase attraction flow to the ladder entrance. This has been an on going problem for a number of years which affects both fish passage and gravel accumulation at the canal headworks, the situation needs to be resolved by installing a flash board system that can be raised or lowered as needed.

In the summer, Stanfield Canal was completely closed to remove vegetation from the canal above the juvenile screens. This is the second time the canal has been dewatered during irrigation season. The canal was not lowered slowly and flushed to allow juveniles to exit before dewatering. To ensure that juveniles are not stranded during the dewatering of canals and possible canal breaks, irrigation districts need to coordinate with the Umatilla Basin Fish Facility Operations and Maintenance and UFPO staffs.

Boyd's hydropower facility resulted in less than optimal passage conditions during peak migratory periods. The entire flashdam remained in during the early spring when adult steelhead and spring chinook were moving through the system even though the facility did not operate the entire project year. A section of the flashdam needs to be taken out to facilitate adult passage through the site whenever Boyd's is not in operation. Coordination between the operators and Fish Facility Operations needs to take place to ensure that steps can be taken to provide better passage conditions.

Severe down cutting of the river channel downstream of the east side ladder at Dillon Dam occurred in late January and early February 2003. This resulted in an elevated differential across the fish entrance of the ladder. Low flow levels may preclude adults from passing through the site effectively in the fall.

There were problems noted during the operation of the WEID headworks and/or juvenile facility. The facility was not being operated according to criteria during the spring. Low flows and inadequate staffing to operate the sampling facility resulted in passage delays, inadequate passage conditions, and increased susceptibility to predation. Large numbers of juveniles migrate through the west bank system and need to be flushed through the system. Currently, Umatilla Passage Evaluation staff are seeking appropriate strategies for operations and modifications to the existing design in order to ensure optimal passage conditions through the Threemile west bank bypass/ trap facility

The last six annual reports have identified the need to update the passage facilities operational criteria developed by NMFS. Changes have been made to the criteria at a number of facilities without being formalized. It is important that these criteria be reviewed and updated.

Task 2 - Operation of Adult Trapping Facilities

Task 2.1 - Threemile Dam Adult Trapping

The Threemile Dam east bank ladder and adult facility both performed satisfactorily again during the 2002/2003 season. Few high magnitude flow events and debris loads were experienced this year which resulted in the ladder being open most of season. The adult facility was closed from January 27 to 28 and from January 30 to February 3 due to river conditions.

Debris and silt in the forebay can restrict flows to the ladder and adult facility and limit the ability to release fish directly into the river at the site. Again this year, there was a lesser amount of silt and debris accumulation in the dam forebay. A combination of forebay dredging and the lack of high flow events minimized siltation problems.

Volitional migration of adults began in December 2002. At that time, a five day trapping/ nine day volitional migration rotation was implemented after the majority of the fall run was over. This schedule was adjusted as needed based on steelhead broodstock collections and CWT recoveries. Video/trapping rotations continued until May 18, 2003. At that time, continuous trapping was reinitiated due to passage criteria.

This was the second year that steelhead adults were enumerated by brood year in the late spring. In previous years, all steelhead captured prior to the trap being closed in the early summer were considered to be of that brood year. This year attempts were made to segregate these fish between 2003 and 2004 brood years. Coloration and condition are used as indicators for making these brood year determinations. Numbers seen this year were significantly higher than observed in previous years.

Again this year, spring chinook were captured after the trap was reopened in the fall. Over the past decade, spring chinook adults have been observed occasionally in the summer (Zimmerman and Duke 2001). However, this year 6 spring chinook adults were

trapped from August 22 to the end of September.

Enumeration during the winter and spring using video counting was generally a success. Identification could generally be made of adipose clipped versus unmarked steelhead and jack versus adult spring chinook. During low visibility periods, mark identification on summer steelhead could not always be determined and these steelhead were listed in the records as being of unknown origin. One high turbidity period occurred during the spring taping this year making visual identifications of adult passage impossible. No attempts were made to determine sex or actual marks from the videotape. Sex ratio and mark group composition for each species were estimated from data collected during trapping operations.

There was a significant amount of downstream movement past the counting station again this year. This occurred with both steelhead and spring chinook. However, with the timing of the lead gate change of operation for a low movement period (noon) the double counting of adults located in the area between the counting station and the lead gate is minimized. Also, kelts are generally identifiable. This allows kelts to be recorded separately and not mis-classified as fallbacks.

A total of 48.7% of the steelhead run, 0.19% of the fall chinook, 1.4% of the coho and 38.9% of the spring chinook were video counted. The high percentage of summer steelhead and spring chinook video taped is consistent with the project objective to maximize the periods of volitional migration for both adults. The small percentage of fall chinook and coho taped is reflective of starting the video period after the majority of the fall run has returned.

Again this year, a high incidence of mechanical damage to the head and jaw areas of spring chinook was observed by the project at Threemile Dam. Low flow levels in the lower Umatilla River may have been the contributing factor to the condition of the fish observed at Threemile Dam (Zimmerman and Duke 2001). Numerous reports and observations of fish jumping in bedrock areas of the lower river and at Brownell Dam have been documented for the past few years. The project continues to recommend the removal of the Brownell Dam since it is no longer operating as a diversion structure.

Due to the large number of fall chinook subjacks collected the past few years, the AOP requires that only a subsample of the CWT subjacks be sacrificed. The size of the subjacks was larger this year also. Historically, the size range for subjacks was set at less than 15 inches (380mm). Due the large size range of subjacks the past few years, the length for subjacks has been adjusted to 400mm.

Significant numbers of spring chinook "minijacks" were captured in the Threemile Dam trap. These fish are confirmed to be from the current year releases. All the CWT subjacks were sacrificed in order to determine origin. The rest were released into the forebay at Threemile Dam. None were transported upstream. These fish were not included in the spring chinook return counts.

Task 2.2 - Westland Adult Trapping

The combination of extended natural and enhanced flows the last few years have resulted in the Westland bypass being open until early summer. This allows kelts to volitionally migrate out of the system and none were captured at Westland again this year.

Task 3 - Operation of Juvenile Trapping Facilities

Task 3.1 - Westland Juvenile Facility Operations

There were few problems at the Westland juvenile collection facility. Problems noted in earlier years with fluctuating canal forebay elevations and the bypass outfall have ceased to be a concern the past four years.

A combination of extended natural flows and flow augmentation allowed the facility to be operated in the bypass mode until July 4. This allowed the majority of the juvenile outmigration to be bypassed at Westland. Maintaining McKay Reservoir storage releases into the summer is now the standard operating procedure except for all but the driest years. This permits Westland to be operated primarily in the bypass mode during the juvenile outmigration period and the majority of the smolts will be able to migrate volitionally. The number of juveniles trapped at Westland continues to be low and trap and haul operations are more than adequate for assisting this late outmigration component under this current scenario.

Fish passage storage releases were tapered down in 25 cfs increments from 100 cfs on July 3 to 0 cfs on July 7. The ladder and bypass were closed July 4 as flows were reduced to minimize the number of juveniles below Westland Dam. Even though flows continued to crest Westland Dam, the minimal depth of the spill seems to be a deterrent to juveniles. In combination with the large flow volume entering Westland Canal, most juveniles are thought to enter the canal where they can be captured

With the low number of juveniles being trapped at Westland and no adults being captured, the trapping facility is operated without the separator and adult holding pond being used. All fish that enter the facility are trapped in the juvenile holding pond where they are more readily accessed.

The decision to discontinue trapping is based on the low number of salmonids in combination with a significant increase in non-salmonids. This condition is usually signaled by an increase in the poundage of fish hauled from the facility towards the end of the trapping period. This increase in poundage is almost exclusively comprised of larger sized non-salmonids. In addition, the decision also includes an assessment of the number of sub-yearling coho and juvenile summer steelhead present in the trap which are probably rearing in this area and not migrating downstream.

Poor water quality conditions are generally observed every year during trapping at Westland. However, the low numbers of juveniles being trapped lessen the constraints of the facility and the site is adequate for current operations.

Task 3.2 - Threemile Dam Juvenile Facility Operations

The ideal passage condition for the west bank juvenile bypass would be to operate it at the 35 cfs level. However, the facility continues to be utilized annually by the Umatilla Passage Evaluation project in order to monitor juvenile outmigration. To facilitate the monitoring program, the headworks and juvenile facility were opened on March 3, two weeks before WEID began irrigation deliveries, and the bypass has to be operated at the reduced 5 cfs level. Outmigration monitoring continued until July 1 when the trapping equipment was removed for the summer. The juvenile bypass flow was increased to 35 cfs until it closed July 3 to flush any remaining juveniles through the facility. Numbers of salmonids observed at the facility just prior to closure were extremely low.

Task 4 - Adult and Juvenile Transportation

Task 4.1 - Threemile Dam Adult Hauling

Project hauling equipment was generally adequate for adult transport needs in 2002/2003. The flatbed mounted, 750 gallon tanker provided a much needed function for hauling adult chinook when numbers are too low to justify use of the 3,000 gallon tanker.

The UBP flow enhancement effort has substantially reduced the number of fish that need to be transported upstream from Threemile Dam. With the exception of brood, adults were only hauled from June 2 to July 6. Fish were either released at, or volitionally migrated past Threemile Dam the rest of the year. All adults were hauled to Bear Creek and/or Thornhollow for release as per criteria. Condition of adults at release generally appeared good at all sites. There were no transport mortalities observed on the fish hauled from Threemile Dam.

The use of McKay Reservoir storage releases in the fall and spring for adult passage is anticipated to continue in the future for all but the driest years. This will permit the majority of adults to migrate volitionally. The number of adults requiring transportation on an annual basis should continue to remain low under this operating scenario.

As noted in past annual reports, a decision has been reached to discontinue transporting early fall returning adults (late August/early September). Even though the 30 day, 150 cfs criteria is not met when these fish return, only small numbers are generally trapped and fall flow enhancement efforts usually increase flows to criteria levels within one or two weeks.

No lower river release sites were used for fish hauled from Threemile Dam this year. The Yoakum site was used for the fall chinook hauled from Ringold Springs Hatchery. Yoakum is the only suitable lower river adult release site available. This site is located on

private property and can only be used with advance permission. Release conditions at the site during low flows are marginal. The Pendleton boat ramp provides good stream access but release conditions here are even more marginal during low flows as the site is located on a side channel, not the main river channel. The release site located at the Pendleton acclimation facility (ODFW) has not been used yet. With the limited numbers of adults currently being hauled, the available release sites should meet project needs. This assumes that access will continue to be available at Yoakum.

Task 4.2 - Westland Adult Hauling

No adults were hauled from Westland this year.

Task 4.3 - Westland Juvenile Hauling

Due to the extended flow enhancement efforts, only small numbers of juveniles were trapped again this year at Westland. The use of McKay Reservoir storage releases to extend the spring/summer passage period for juveniles is anticipated to continue in the future for all but the driest years. This will maximize instream migration of juveniles and minimize transportation. The number of juveniles requiring transportation on an annual basis should continue to remain low under this operating strategy.

The small numbers of fish being trapped at Westland eliminates the need for a fish pump, all fish are loaded using dipnets. The Pescalator fish pump is still stationed at Westland and would be available for use by another project in the Columbia Basin.

Task 4.4 - Threemile Dam Juvenile Hauling

Only a very small number of juvenile salmonids were observed at the Threemile Dam west bank juvenile facility in the week prior to shutdown. The trap was not turned on and no juveniles were transported from the facility.

Task 4.5 - Other Hauling Operations

Fish Passage Operations personnel and equipment were used again in 2002 to transport fall chinook adults from Ringold Springs Hatchery to the Umatilla River. The NMFS requires that these fish not be outplanted until November to minimize straying concerns. This year, with the limited number of fall chinook available, adults were hauled starting October 31 to November 19 and were directly released into the river. This eliminated the intermediate step of holding adults transported in October at Threemile Dam until outplanting could occur in November. Fish availability and return timing to Priest Rapids and Ringold Springs hatcheries will determine whether fish are hauled in October, November, or both.

The adults transported from Ringold Springs this year comprised approximately 42% of the adult fall chinook spawning population in the Umatilla River. This program continues to be an effective tool for utilizing surplus hatchery adults and for supplementing

the natural fall chinook population in the Umatilla River. The handling and transportation aspects appear to have little or no adverse impact on natural spawning success.

The project also transported spring chinook from Ringold Springs and Threemile Dam to the South Fork Walla Walla holding and spawning facility and outplanted the survivors as part of the Walla Walla outplanting efforts. More detailed discussion of this activity can be found in the Walla Walla Fish Passage Operations annual report.

Transport survival for both these efforts was very good again this year. There were 4 observed mortalities out of the 859 (0.4%) fall chinook adults released in November and none from the spring chinook transports.

Objective 5 - Coordination of Passage Program

Task 5.1 – Passage Facility Operation and Maintenance Oversight

The project coordinates with Umatilla Basin Fish Facility Operations and Maintenance personnel on both daily operations and facility maintenance of ladder and screen sites. The Umatilla Basin Fish Facility Operations and Maintenance staff is a well established crew and has been working together for a number of years. The expertise illustrated by the crew makes coordination of facility O&M requirements a task easily undertaken.

Task 5.2 – Management of McKay Fish Flow Releases

The timing and magnitude of the fall McKay Reservoir fish passage flow releases remains similar to past years. Initial releases in 2002 were started August 22 in coordination with the discontinuation of WID storage releases in order to maintain flows in the mainstem below McKay Creek for juvenile production as well as for adult attraction and passage in the lower Umatilla River. No fall chinook adults were captured until September 3; however, the first summer steelhead was trapped August 26. These releases resulted in observed flow below Threemile Dam in excess of 150 cfs in late September. Releases were increased in late September from 75 cfs to 100 cfs on September 20 and then again on October 4 from 100 cfs to 110 cfs. Historically, fall flows have been in the range of 150 cfs. This reduction in the fall flow level is due to the fact that McKay Reservoir did not fill in 2002 and less water available for fisheries enhancement use. This resulted in lower river flows approaching an excess of 200 cfs by the end of October. No significant returns of any species were noted in September. Tributary entry of all species appears to be based on inherent biological timing as long as flow and temperature conditions do not preclude entry. This factor may be most important for summer steelhead, as adults have been captured during every month for the past few project years.

Flow releases into lower McKay Creek below McKay Reservoir were continued year around. Fall enhancement flows were tapered down from 110 cfs to 10 cfs in mid November. A minimum flow of 10 cfs was maintained all winter to sustain juvenile production in the stream reach. Historically, significant numbers of juvenile steelhead and

coho, as well as a few bull trout (*Salvelinus confluentus*) were found rearing in lower McKay Creek. These winter releases during drought years such as 2002 affect the ability of the reservoir to fill to capacity which resulted in less water available for passage during the fall of 2002.

It has become standard practice to extend spring passage releases into July. Natural spring flows maintained the river at levels above target levels until early June. Water was released from McKay Reservoir beginning in early June to maintain a target flow level of 150 cfs at Dillon through the end of June. McKay Reservoir releases were decreased in 25 cfs increments from 100 cfs on July 4 to 0 cfs on July 7.

The AOP outlines priority flow timing and levels for use of stored water. Water releases during the late spring/early summer from McKay Reservoir provides both juvenile and adult passage benefits. It extends the natural upstream migration period for spring chinook and provides a longer period for volitional outmigration of both natural and hatchery fall chinook juveniles. It also significantly reduces the reliance on artificial transportation for both adults and juveniles. Because of these benefits the spring period is the top priority and flows are maintained at criteria through the spring which may result in reduced flow available for the fall as was the case in 2002. The summer is the lowest of the three priorities outlined and not enough storage was available in McKay Reservoir to provide flows during this period.

Typically, in the spring, OWRD and BOR produce a “Beginning Storage Report” for McKay Reservoir which identifies the amount of water available in the reservoir for fisheries uses for that specific year. However, in 2003 changes in the McKay Reservoir allocations were made in the “Beginning Storage Report” which resulted in less water being available for fisheries use. The change in allocations was not communicated until after spring fisheries enhancement releases were well underway and restricted the flexibility for the project to balance flow releases between the spring and fall. This will result in less flow being available for the fall of 2003 and will require a delay in the release schedule which will be discussed in next year’s annual report.

Task 5.3 – Coordination of Exchange Program

The Phase I exchange with WEID was conducted during both the fall and spring this past year. The summer start date for the Phase I exchange continues to be mid-August to match fall chinook migration timing in the mainstem Columbia River. The exchange was initiated August 16, 2002 but only a few fall chinook, summer steelhead and coho were captured prior to mid September. Tributary entry of all species appears to be based on an inherent biological timing as long as flow and temperature conditions do not preclude entry.

The Phase I exchange was reinitiated in May and discontinued on July 1, 2003 as per UBP criteria. Investigations still need to made into the operation of Phase I to provide instream flows all summer below Threemile Dam. This would allow year round opportunity for steelhead entry into the Umatilla River, provide attraction flows for upmigrating lamprey, and minimize problems with protecting summer fish flows when WEID would be diverting water from the river.

Development of an annual operating plan for the UBP would be useful as an operating guideline for the complex exchange program. The BOR has completed a draft in the summer of 2003. Annual operating plans are an extremely useful tool which have been used for basin fish management decisions for many years and would provide a similar benefit for water management.

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Appendices

Appendix A. 2002-2003 Umatilla River Water Parameter Data.

	UMAO TEMPERATURES		FLOW @	FLOW @	SFC	CSC	WLC	FLOW @	FLOW @
DATE	F	C	PENDLETON	YOAKUM	FLOWS	FLOWS	FLOWS	DILLON	UMATILLA
1-Sep-02	69.7	20.9	30	104	0	0	13	61	103
2-Sep-02	69.8	21.0	30	105	0	0	14	63	102
3-Sep-02	68.1	20.0	29	106	0	0	13	65	99
4-Sep-02	65.4	18.6	33	111	0	0	13	68	104
5-Sep-02	64.2	17.9	33	113	0	0	17	67	109
6-Sep-02	64.2	17.9	33	111	0	0	27	66	103
7-Sep-02	63.3	17.4	35	110	0	0	24	69	110
8-Sep-02	63.1	17.3	35	110	0	0	24	69	118
9-Sep-02	63.8	17.7	35	109	0	0	23	69	112
10-Sep-02	64.9	18.3	33	105	0	0	23	67	108
11-Sep-02	65.8	18.8	31	105	0	0	20	66	105
12-Sep-02	66.7	19.3	30	102	0	0	10	61	104
13-Sep-02	67.2	19.5	30	104	0	0	10	63	103
14-Sep-02	66.7	19.3	30	114	0	0	10	72	105
15-Sep-02	65.9	18.8	30	114	0	0	10	75	118
16-Sep-02	65.0	18.3	31	108	0	0	10	72	115
17-Sep-02	64.7	18.2	38	112	0	0	24	69	111
18-Sep-02	63.8	17.7	45	128	19	0	33	61	109
19-Sep-02	63.7	17.6	43	130	12	0	35	68	109
20-Sep-02	63.9	17.7	37	119	0	0	33	68	119
21-Sep-02	62.1	16.7	37	135	0	0	28	87	134
22-Sep-02	60.5	15.8	37	138	0	0	28	93	148
23-Sep-02	60.1	15.6	36	138	0	0	28	92	153
24-Sep-02	60.4	15.8	36	137	0	0	28	91	151
25-Sep-02	61.1	16.1	36	137	0	0	28	90	151
26-Sep-02	60.3	15.7	36	134	0	0	29	90	153
27-Sep-02	60.8	16.0	38	137	0	0	29	91	153
28-Sep-02	60.6	15.9	41	138	0	0	22	92	156
29-Sep-02	59.6	15.3	41	141	0	0	18	94	157
30-Sep-02	57.1	13.9	45	143	0	0	22	93	153
1-Oct-02	55.8	13.2	47	147	0	0	28	92	149
2-Oct-02	55.2	12.9	48	150	0	0	30	93	147
3-Oct-02	56.5	13.6	48	151	0	0	29	91	156
4-Oct-02	58.2	14.6	56	160	0	0	31	87	160
5-Oct-02	59.8	15.4	60	172	0	0	33	94	159
6-Oct-02	60.2	15.6	57	168	0	0	33	94	166
7-Oct-02	60.0	15.6	54	162	0	0	33	91	164
8-Oct-02	59.6	15.4	53	158	0	0	42	89	159
9-Oct-02	59.0	15.0	52	157	0	0	47	89	160
10-Oct-02	57.7	14.3	52	158	0	0	44	90	159
11-Oct-02	55.5	13.1	52	158	0	0	40	93	164
12-Oct-02	53.2	11.8	52	158	0	0	41	94	172
13-Oct-02	51.7	10.9	53	160	0	0	41	95	174
14-Oct-02	51.1	10.6	53	159	0	0	33	95	176
15-Oct-02	51.2	10.7	53	159	0	0	31	93	172
16-Oct-02	51.8	11.0	54	159	0	0	31	93	171
17-Oct-02	52.1	11.2	55	162	0	0	31	95	171
18-Oct-02	52.2	11.2	55	162	0	0	31	100	172
19-Oct-02	53.0	11.7	57	164	0	0	31	104	182
20-Oct-02	55.0	12.8	56	164	0	0	31	103	183
21-Oct-02	55.7	13.2	57	165	0	0	31	104	183
22-Oct-02	54.8	12.7	56	166	0	0	31	106	183
23-Oct-02	52.8	11.5	57	167	0	0	38	109	186
24-Oct-02	49.9	10.0	58	167	0	0	38	115	194
25-Oct-02	47.8	8.8	59	168	0	0	31	115	205
26-Oct-02	46.4	8.0	60	169	0	0	28	115	199
27-Oct-02	45.2	7.3	60	170	0	0	28	119	201
28-Oct-02	46.8	8.2	61	171	0	0	28	120	203
29-Oct-02	47.8	8.8	72	188	0	0	28	136	209
30-Oct-02	44.5	7.0	70	183	0	0	28	133	217
31-Oct-02	41.6	5.3	66	178	0	0	12	157	221

Appendix A. (continued)

DATE	UMAO TEMPERATURES F	C	FLOW @ PENDLETON	FLOW @ YOAKUM	SFC FLOWS	CSC FLOWS	WLC FLOWS	FLOW @ DILLON	FLOW @ UMATILLA
1-Nov-02	39.5	4.2	64	176	0	0	NA	178	277
2-Nov-02	38.5	3.6	64	176	0	0	NA	172	253
3-Nov-02	38.6	3.7	64	176	0	0	NA	171	249
4-Nov-02	39.1	3.9	65	177	0	0	0	170	245
5-Nov-02	40.3	4.6	67	181	0	0	0	173	245
6-Nov-02	40.9	4.9	67	182	0	0	0	174	244
7-Nov-02	42.8	6.0	66	181	0	0	0	174	243
8-Nov-02	46.0	7.8	73	185	0	0	0	176	243
9-Nov-02	48.4	9.1	81	194	0	0	0	185	247
10-Nov-02	49.4	9.6	82	197	0	0	0	189	254
11-Nov-02	49.6	9.8	80	195	0	0	0	188	254
12-Nov-02	50.0	10.0	78	194	0	0	0	187	251
13-Nov-02	49.7	9.8	79	198	0	0	0	189	251
14-Nov-02	49.8	9.9	77	195	0	0	0	189	251
15-Nov-02	48.2	9.0	77	193	0	0	0	187	248
16-Nov-02	46.7	8.2	76	193	0	0	0	189	247
17-Nov-02	46.6	8.1	74	191	0	0	0	188	244
18-Nov-02	46.4	8.0	74	190	0	0	0	184	240
19-Nov-02	48.4	9.1	78	194	0	0	0	182	242
20-Nov-02	49.3	9.6	79	191	0	0	0	183	244
21-Nov-02	49.1	9.5	77	169	0	0	0	165	233
22-Nov-02	49.3	9.6	76	142	0	0	0	140	209
23-Nov-02	49.8	9.9	77	118	0	0	0	113	185
24-Nov-02	47.6	8.6	80	98	0	0	0	94	164
25-Nov-02	43.8	6.6	78	95	0	0	0	90	150
26-Nov-02	41.3	5.2	76	93	0	0	0	88	147
27-Nov-02	40.5	4.7	76	92	0	0	0	88	145
28-Nov-02	40.7	4.8	74	92	0	0	0	87	145
29-Nov-02	40.7	4.8	74	92	0	0	0	87	144
30-Nov-02	40.7	4.8	74	92	0	0	0	86	142
1-Dec-02	40.8	4.9	74	92	0	0	0	86	141
2-Dec-02	40.8	4.9	73	92	0	0	0	86	141
3-Dec-02	40.7	4.8	70	90	0	0	0	86	140
4-Dec-02	40.9	5.0	70	93	0	0	0	88	139
5-Dec-02	41.4	5.2	70	98	0	0	0	90	139
6-Dec-02	41.8	5.5	70	98	0	0	0	90	139
7-Dec-02	42.2	5.7	70	98	0	0	0	90	136
8-Dec-02	42.7	6.0	70	98	0	0	0	89	138
9-Dec-02	43.1	6.2	69	98	0	0	0	89	137
10-Dec-02	42.9	6.0	73	102	0	0	0	90	137
11-Dec-02	42.5	5.9	75	108	0	0	0	93	141
12-Dec-02	43.7	6.5	80	115	0	0	0	99	146
13-Dec-02	45.7	7.6	83	122	0	0	0	105	145
14-Dec-02	47.7	8.7	86	123	0	0	0	108	154
15-Dec-02	48.8	9.3	91	129	0	0	0	110	151
16-Dec-02	48.8	9.3	88	129	0	0	0	112	154
17-Dec-02	46.0	7.8	88	128	0	0	0	113	152
18-Dec-02	43.4	6.3	87	127	0	0	0	113	153
19-Dec-02	41.2	5.1	85	123	0	0	0	110	152
20-Dec-02	40.8	4.9	82	120	0	0	0	107	150
21-Dec-02	41.2	5.1	83	122	0	0	0	107	149
22-Dec-02	41.2	5.1	85	124	0	0	0	110	149
23-Dec-02	41.6	5.3	83	121	0	0	0	108	150
24-Dec-02	40.6	4.8	81	119	0	0	0	104	146
25-Dec-02	40.1	4.5	81	118	0	0	0	103	145
26-Dec-02	40.4	4.7	84	122	0	0	0	105	146
27-Dec-02	41.9	5.5	86	133	0	0	0	117	156
28-Dec-02	43.3	6.3	92	130	0	0	0	114	157
29-Dec-02	43.2	6.2	106	163	0	0	0	144	174
30-Dec-02	42.9	6.1	126	178	0	0	0	154	187
31-Dec-02	43.5	6.4	NA	289	0	0	0	216	210

Appendix A. (continued)

DATE	UMAO TEMPERATURES F	C	FLOW @ PENDLETON	FLOW @ YOAKUM	SFC FLOWS	CSC FLOWS	WLC FLOWS	FLOW @ DILLON	FLOW @ UMATILLA
1-Jan-03	42.9	6.1	NA	374	0	0	0	328	344
2-Jan-03	43.2	6.2	NA	327	0	0	0	306	362
3-Jan-03	45.1	7.3	NA	452	0	0	0	326	356
4-Jan-03	46.8	8.2	NA	608	0	0	0	516	499
5-Jan-03	44.9	7.2	NA	691	0	73	0	553	537
6-Jan-03	42.4	5.8	615	651	0	191	0	565	634
7-Jan-03	42.0	5.6	478	511	0	206	0	349	454
8-Jan-03	41.7	5.4	376	423	0	161	0	262	304
9-Jan-03	41.0	5.0	312	364	0	64	0	295	314
10-Jan-03	40.3	4.6	268	321	0	NA	0	327	375
11-Jan-03	40.2	4.6	235	290	0	NA	0	281	339
12-Jan-03	41.2	5.1	212	271	0	NA	0	264	315
13-Jan-03	42.0	5.5	205	258	0	NA	0	254	298
14-Jan-03	43.0	6.1	221	261	0	NA	0	251	283
15-Jan-03	43.8	6.5	281	306	0	NA	0	279	303
16-Jan-03	43.7	6.5	303	346	0	NA	0	340	365
17-Jan-03	43.2	6.2	283	330	0	NA	0	328	379
18-Jan-03	42.4	5.8	258	305	0	NA	0	299	355
19-Jan-03	41.9	5.5	234	283	0	NA	0	274	329
20-Jan-03	41.9	5.5	212	265	0	NA	0	260	307
21-Jan-03	41.7	5.4	198	254	0	NA	0	249	289
22-Jan-03	41.3	5.2	189	245	0	NA	0	242	277
23-Jan-03	41.5	5.3	196	244	0	NA	0	239	273
24-Jan-03	42.6	5.9	210	253	0	NA	0	243	274
25-Jan-03	44.8	7.1	245	279	0	NA	0	261	291
26-Jan-03	47.2	8.4	789	368	0	NA	0	311	327
27-Jan-03	49.0	9.4	2393	2326	0	174	33	2041	1271
28-Jan-03	45.1	7.3	1765	1953	0	203	54	1990	2322
29-Jan-03	44.0	6.7	1200	1250	0	225	60	1150	1332
30-Jan-03	44.3	6.8	2984	2501	0	223	63	1917	1271
31-Jan-03	46.3	7.9	4571	5287	0	208	63	4980	4664
1-Feb-03	46.8	8.2	3780	4770	0	216	65	4721	4433
2-Feb-03	44.7	7.1	2030	3306	0	218	66	3383	3582
3-Feb-03	44.4	6.9	1520	2188	0	212	66	1965	2349
4-Feb-03	43.4	6.4	1375	1679	0	220	69	1368	1815
5-Feb-03	42.1	5.6	1102	1340	0	217	71	1014	1397
6-Feb-03	40.4	4.7	896	1099	0	221	67	790	1106
7-Feb-03	40.1	4.5	787	911	0	222	62	633	886
8-Feb-03	40.3	4.6	697	785	0	218	57	536	744
9-Feb-03	40.5	4.7	614	688	0	213	57	455	648
10-Feb-03	41.6	5.3	542	612	0	222	57	375	554
11-Feb-03	42.3	5.7	504	558	0	222	57	311	469
12-Feb-03	42.0	5.6	490	519	0	225	56	268	401
13-Feb-03	42.2	5.7	468	496	0	214	56	276	357
14-Feb-03	43.6	6.4	524	596	0	223	56	319	351
15-Feb-03	44.7	7.1	564	687	0	233	57	383	437
16-Feb-03	45.0	7.2	721	822	0	230	56	460	500
17-Feb-03	45.6	7.5	944	1172	0	232	55	769	786
18-Feb-03	46.1	7.8	1084	1309	0	225	55	891	967
19-Feb-03	44.8	7.1	1149	1405	0	220	62	1009	1129
20-Feb-03	44.4	6.9	1070	1316	0	208	65	944	1077
21-Feb-03	45.9	7.7	1030	1254	0	223	65	880	1016
22-Feb-03	46.6	8.1	1135	1300	0	235	62	885	976
23-Feb-03	44.4	6.9	1186	1360	0	224	59	968	1075
24-Feb-03	41.1	5.0	1056	1245	0	223	59	895	1048
25-Feb-03	39.0	3.9	929	1069	0	223	59	753	896
26-Feb-03	39.1	4.0	814	930	0	225	59	633	741
27-Feb-03	40.5	4.7	703	811	0	223	59	534	634
28-Feb-03	41.6	5.3	615	709	0	224	59	429	537

Appendix A. (continued)

DATE	UMAO TEMPERATURES F	C	FLOW @ PENDLETON	FLOW @ YOAKUM	SFC FLOWS	CSC FLOWS	WLC FLOWS	FLOW @ DILLON	FLOW @ UMATILLA
1-Mar-03	42.4	5.8	553	646	0	221	59	374	461
2-Mar-03	42.8	6.0	492	581	0	223	38	318	389
3-Mar-03	44.8	7.1	499	569	0	229	36	292	356
4-Mar-03	46.6	8.1	508	593	0	233	54	292	343
5-Mar-03	46.7	8.2	510	601	0	233	57	295	336
6-Mar-03	46.2	7.9	568	643	0	223	57	338	368
7-Mar-03	45.6	7.6	730	747	0	220	60	439	461
8-Mar-03	45.2	7.3	1723	1787	0	222	62	1219	952
9-Mar-03	45.3	7.4	1784	2051	0	211	62	1674	1779
10-Mar-03	47.8	8.8	1879	2243	0	218	66	1782	1821
11-Mar-03	48.6	9.2	1808	2695	0	223	69	2227	2245
12-Mar-03	48.1	8.9	1962	2889	0	214	69	2493	2377
13-Mar-03	48.6	9.2	2905	3847	0	209	73	3642	2940
14-Mar-03	47.6	8.7	3021	4273	0	217	76	4348	3801
15-Mar-03	47.4	8.6	2462	3679	0	215	75	3707	3301
16-Mar-03	46.0	7.8	2734	3981	0	223	75	3979	3525
17-Mar-03	46.2	7.9	1807	3110	0	215	78	3196	2928
18-Mar-03	46.2	7.9	1651	2311	0	218	94	2222	2202
19-Mar-03	47.9	8.8	1544	1853	0	223	115	1633	1698
20-Mar-03	49.9	9.9	1409	1634	0	226	115	1358	1385
21-Mar-03	49.8	9.9	1375	1555	0	229	115	1257	1261
22-Mar-03	49.0	9.4	1632	1838	0	234	115	1459	1326
23-Mar-03	47.2	8.4	2034	3043	0	224	105	2767	2268
24-Mar-03	46.1	7.8	1721	2654	0	219	106	2605	2384
25-Mar-03	47.5	8.6	1709	2162	0	220	129	2017	1909
26-Mar-03	47.7	8.7	1728	2064	0	224	138	1815	1640
27-Mar-03	47.0	8.3	1713	2048	0	229	141	1805	1649
28-Mar-03	46.7	8.1	1620	1885	0	223	139	1645	1539
29-Mar-03	49.0	9.5	1424	1658	0	224	145	1392	1318
30-Mar-03	51.7	10.9	1238	1485	5	224	146	1198	1120
31-Mar-03	53.1	11.7	1276	1460	68	229	146	1095	980
1-Apr-03	51.5	10.8	1605	1765	68	229	146	1359	1164
2-Apr-03	49.9	9.9	1575	1770	68	215	148	1444	1337
3-Apr-03	47.7	8.7	1455	1633	68	218	152	1335	1248
4-Apr-03	46.3	7.9	1270	1543	67	222	151	1229	1130
5-Apr-03	47.0	8.3	1131	1495	67	220	158	1170	1077
6-Apr-03	47.8	8.8	1116	1478	68	223	165	1121	993
7-Apr-03	48.6	9.2	1147	1637	67	231	168	1261	1080
8-Apr-03	50.8	10.5	1223	1823	67	225	177	1449	1260
9-Apr-03	53.5	11.9	1352	1952	82	229	184	1586	1388
10-Apr-03	52.8	11.6	1385	1940	86	214	187	1627	1469
11-Apr-03	53.6	12.0	1385	1871	90	219	179	1526	1366
12-Apr-03	53.3	11.9	1341	1810	46	117	180	1605	1372
13-Apr-03	53.4	11.9	1295	1734	0	107	184	1606	1508
14-Apr-03	53.2	11.8	1211	1597	0	216	184	1331	1236
15-Apr-03	53.2	11.8	1028	1380	1	216	181	1103	1031
16-Apr-03	53.6	12.0	919	1218	55	212	182	889	767
17-Apr-03	54.4	12.4	869	1148	72	210	187	805	650
18-Apr-03	52.5	11.4	837	1153	80	210	178	724	648
19-Apr-03	52.9	11.6	750	1048	86	186	168	594	578
20-Apr-03	54.1	12.3	702	982	88	125	171	580	563
21-Apr-03	55.9	13.3	707	956	91	125	173	546	520
22-Apr-03	56.7	13.7	755	995	96	125	167	559	502
23-Apr-03	55.1	12.8	768	1009	99	121	162	590	597
24-Apr-03	54.6	12.5	781	991	103	118	168	577	557
25-Apr-03	53.0	11.7	838	1113	101	175	168	656	630
26-Apr-03	53.9	12.2	895	1152	98	203	161	661	629
27-Apr-03	54.0	12.2	1052	1319	98	214	157	779	776
28-Apr-03	54.9	12.7	1129	1398	98	226	155	842	918
29-Apr-03	56.2	13.5	1113	1457	97	226	155	892	979
30-Apr-03	55.6	13.1	1024	1351	98	218	155	816	926

Appendix A. (continued)

DATE	UMAO TEMPERATURES F	C	FLOW @ PENDLETON	FLOW @ YOAKUM	SFC FLOWS	CSC FLOWS	WLC FLOWS	FLOW @ DILLON	FLOW @ UMATILLA
1-May-03	56.5	13.6	959	1245	103	214	160	734	811
2-May-03	58.5	14.7	910	1154	100	209	166	656	698
3-May-03	59.0	15.0	888	1123	92	206	163	639	635
4-May-03	56.4	13.5	855	1103	86	204	166	627	637
5-May-03	54.4	12.4	891	1136	75	207	164	647	647
6-May-03	54.1	12.3	859	1094	75	206	161	628	649
7-May-03	54.3	12.4	810	1045	83	203	161	611	613
8-May-03	54.4	12.4	726	962	90	166	172	554	546
9-May-03	56.1	13.4	642	897	95	51	176	556	534
10-May-03	58.1	14.5	589	823	92	NA	183	541	558
11-May-03	58.9	15.0	553	744	89	NA	187	473	479
12-May-03	58.8	14.9	595	774	85	NA	186	479	467
13-May-03	59.1	15.0	747	971	80	NA	191	610	612
14-May-03	60.6	15.9	739	942	84	NA	199	592	636
15-May-03	59.4	15.2	741	930	90	NA	193	580	608
16-May-03	56.1	13.4	655	859	92	NA	197	538	584
17-May-03	54.4	12.4	576	764	103	NA	198	457	480
18-May-03	54.6	12.5	520	702	106	NA	198	399	413
19-May-03	57.2	14.0	471	636	100	NA	205	367	330
20-May-03	58.7	14.8	446	581	74	NA	192	299	271
21-May-03	60.8	16.0	428	554	43	NA	188	270	273
22-May-03	64.0	17.8	412	537	15	NA	192	268	265
23-May-03	67.1	19.5	402	519	6	NA	196	260	303
24-May-03	69.0	20.5	406	503	5	NA	204	240	316
25-May-03	67.3	19.6	467	569	5	NA	209	276	333
26-May-03	64.7	18.2	435	555	5	NA	210	284	432
27-May-03	66.0	18.9	387	517	5	NA	209	248	356
28-May-03	69.1	20.6	348	475	5	NA	213	210	280
29-May-03	70.1	21.2	321	432	1	NA	220	168	235
30-May-03	69.2	20.7	308	418	0	NA	219	174	209
31-May-03	66.7	19.3	324	434	0	NA	228	187	239
1-Jun-03	66.8	19.3	287	382	0	NA	234	145	220
2-Jun-03	68.3	20.2	256	406	0	NA	235	146	178
3-Jun-03	68.6	20.3	231	428	0	NA	234	180	202
4-Jun-03	69.2	20.7	211	419	0	NA	233	176	214
5-Jun-03	69.8	21.0	196	415	0	NA	227	166	210
6-Jun-03	70.9	21.6	182	421	0	NA	228	168	194
7-Jun-03	72.4	22.4	165	418	0	NA	233	163	199
8-Jun-03	73.2	22.9	149	420	0	NA	237	162	196
9-Jun-03	71.5	22.0	139	421	0	NA	231	164	199
10-Jun-03	69.2	20.7	131	422	0	NA	226	173	215
11-Jun-03	68.3	20.2	124	421	0	NA	223	169	212
12-Jun-03	69.1	20.6	120	420	0	NA	223	174	217
13-Jun-03	69.1	20.6	113	420	0	NA	223	180	215
14-Jun-03	68.8	20.5	108	418	26	NA	221	175	218
15-Jun-03	69.2	20.7	105	408	29	NA	215	169	209
16-Jun-03	70.1	21.1	101	399	22	NA	208	166	208
17-Jun-03	71.1	21.7	96	389	17	NA	200	159	200
18-Jun-03	70.8	21.6	91	390	19	NA	193	161	203
19-Jun-03	67.0	19.4	89	388	17	NA	177	162	223
20-Jun-03	64.2	17.9	87	393	17	NA	168	170	211
21-Jun-03	62.9	17.1	87	400	22	NA	162	188	244
22-Jun-03	62.6	17.0	86	382	21	NA	153	187	254
23-Jun-03	64.1	17.8	85	364	20	NA	152	170	231
24-Jun-03	66.2	19.0	82	365	21	NA	155	163	215
25-Jun-03	68.6	20.3	79	366	21	NA	155	163	220
26-Jun-03	70.7	21.5	74	370	21	NA	167	160	220
27-Jun-03	72.9	22.7	71	369	20	NA	174	155	204
28-Jun-03	73.8	23.2	68	359	19	NA	176	154	212
29-Jun-03	73.1	22.8	64	328	19	NA	171	135	203
30-Jun-03	71.7	22.1	63	308	18	NA	169	111	182

Appendix A. (continued)

DATE	UMAO TEMPERATURES F	C	FLOW @ PENDLETON	FLOW @ YOAKUM	SFC FLOWS	CSC FLOWS	WLC FLOWS	FLOW @ DILLON	FLOW @ UMATILLA
1-Jul-03	70.5	21.4	62	306	18	NA	178	99	129
2-Jul-03	68.4	20.2	61	305	17	NA	180	94	109
3-Jul-03	69.5	20.8	59	301	17	NA	175	93	104
4-Jul-03	71.3	21.8	57	291	16	NA	174	88	84
5-Jul-03	73.0	22.8	54	273	15	NA	173	75	66
6-Jul-03	75.6	24.2	53	247	14	NA	162	57	42
7-Jul-03	75.0	23.9	52	220	12	NA	161	49	20
8-Jul-03	70.6	21.4	49	208	11	NA	158	13	2
9-Jul-03	74.2	23.4	48	206	4	NA	160	18	2
10-Jul-03	75.6	24.2	45	212	0	NA	164	18	2
11-Jul-03	76.8	24.9	43	217	0	NA	168	17	2
12-Jul-03	75.9	24.4	41	225	0	NA	169	14	7
13-Jul-03	71.2	21.8	40	214	0	NA	171	14	2
14-Jul-03	72.3	22.4	41	211	0	NA	175	9	2
15-Jul-03	74.7	23.7	39	208	0	NA	174	7	2
16-Jul-03	74.4	23.6	38	206	0	NA	171	6	2
17-Jul-03	72.3	22.4	37	195	0	NA	155	5	2
18-Jul-03	74.1	23.4	36	201	0	NA	149	5	2
19-Jul-03	76.2	24.6	34	196	0	NA	145	6	2
20-Jul-03	77.0	25.0	32	195	0	NA	147	5	2
21-Jul-03	76.2	24.5	31	197	0	0	152	5	2
22-Jul-03	77.2	25.1	31	198	0	0	151	5	2
23-Jul-03	78.3	25.7	30	196	0	0	153	5	2
24-Jul-03	75.0	23.9	30	194	2	0	159	5	2
25-Jul-03	72.5	22.5	31	191	5	0	153	6	2
26-Jul-03	71.2	21.8	32	203	15	0	147	6	2
27-Jul-03	74.2	23.5	31	215	18	0	151	13	4
28-Jul-03	76.3	24.6	30	207	18	0	152	9	4
29-Jul-03	75.8	24.3	28	193	18	0	139	6	2
30-Jul-03	76.0	24.5	26	185	18	0	124	7	2
31-Jul-03	78.1	25.6	25	183	18	0	125	6	2
1-Aug-03	74.9	23.8	24	183	18	0	127	7	2
2-Aug-03	74.2	23.4	26	195	18	0	129	6	6
3-Aug-03	72.1	22.3	30	200	18	0	130	6	17
4-Aug-03	72.0	22.2	34	201	18	0	129	10	6
5-Aug-03	74.1	23.4	33	202	18	0	136	9	3
6-Aug-03	73.5	23.1	40	202	18	0	135	11	2
7-Aug-03	74.6	23.7	39	184	18	0	126	7	5
8-Aug-03	73.9	23.3	36	169	17	0	121	6	3
9-Aug-03	74.1	23.4	33	166	18	0	122	6	3
10-Aug-03	73.9	23.3	32	171	18	0	133	6	2
11-Aug-03	70.4	21.3	30	169	20	0	137	5	2
12-Aug-03	68.2	20.1	30	173	20	0	138	7	2
13-Aug-03	71.6	22.0	31	182	19	0	138	11	8
14-Aug-03	73.3	22.9	30	188	17	0	128	14	29
15-Aug-03	74.1	23.4	29	185	16	0	124	9	21
16-Aug-03	71.8	22.1	26	183	16	0	125	7	51
17-Aug-03	72.9	22.7	27	187	16	0	126	7	65
18-Aug-03	73.7	23.2	27	197	16	0	129	13	54
19-Aug-03	73.6	23.1	26	192	10	0	134	15	51
20-Aug-03	72.9	22.7	26	180	0	0	139	9	55
21-Aug-03	72.2	22.3	27	174	0	0	143	8	58
22-Aug-03	70.3	21.3	28	168	0	0	153	4	63
23-Aug-03	69.6	20.9	33	164	0	0	161	9	57
24-Aug-03	69.7	20.9	34	164	0	0	163	11	63
25-Aug-03	70.4	21.4	32	165	0	0	161	8	64
26-Aug-03	70.5	21.4	31	168	0	0	154	2	70
27-Aug-03	70.1	21.2	31	173	0	0	154	1	59
28-Aug-03	70.2	21.2	31	172	0	0	134	11	54
29-Aug-03	70.0	21.1	31	164	0	0	123	12	58
30-Aug-03	69.8	21.0	31	158	0	0	123	3	63
31-Aug-03	69.9	21.1	31	156	0	0	123	2	63

Appendix B-1. 2002 Fall Chinook Return Disposition

	TRAPPED				SAC/MORT				RELEASED UPSTREAM			RELEASED @ DAM				BROOD		
DATE	TOTAL	AD	JK	MJ	TOTAL	AD	JK	MJ	TOTAL	AD	JK	TOTAL	AD	JK	MJ	TOTAL	AD	JK
9-03	2	1	1	0	0				0			2	1	1		0		
9-10	10	0	6	4	3		2	1	0			7		4	3	0		
9-11	6	2	1	3	2	1		1	0			4	1	1	2	0		
9-12	10	1	4	5	2		1	1	0			8	1	3	4	0		
9-13	2	0	0	2	0				0			2			2	0		
9-15	3	3	0	0	0				0			3	3			0		
9-16	6	1	4	1	1		1		0			3		2	1	2	1	1
9-17	11	6	4	1	0				0			5		4	1	6	6	
9-18	9	1	3	5	1			1	0			7		3	4	1	1	
9-19	4	1	2	1	0				0			3		2	1	1	1	
9-20	5	1	0	4	1			1	0			3			3	1	1	
9-22	12	1	2	9	0				0			11		2	9	1	1	
9-23	9	3	1	5	1			1	0			5		1	4	3	3	
9-24	16	2	6	8	1		1		0			13		5	8	2	2	
9-25	24	7	5	12	5		3	2	0			12		2	10	7	7	
9-26	23	0	6	17	0				0			22		5	17	1		1
9-27	51	11	10	30	7		2	5	0			33		8	25	11	11	
9-29	214	83	61	70	0				0			125		55	70	89	83	6
9-30	35	11	10	14	16		3	13	0			7		6	1	12	11	1
SEP	452	135	126	191	40	1	13	26	0	0	0	275	6	104	165	137	128	9
10-01	49	15	9	25	3		2	1	0			34	3	7	24	12	12	
10-02	78	33	15	30	8	1	1	6	0			51	14	13	24	19	18	1
10-03	61	16	16	29	8		2	6	0			46	9	14	23	7	7	
10-04	71	15	6	50	12		2	10	0			55	11	4	40	4	4	
10-05	200	45	35	120	24	1	2	21	0			149	17	33	99	27	27	
10-06	208	70	44	94	0				0			139	5	40	94	69	65	4
10-07	248	67	38	143	0				0			212	36	33	143	36	31	5
10-08	134	23	22	89	14		9	5	0			106	11	11	84	14	12	2
10-09	67	14	8	45	0				0			58	5	8	45	9	9	
10-10	99	13	18	68	13		1	12	0			81	10	15	56	5	3	2
10-11	99	24	24	51	7		3	4	0			82	14	21	47	10	10	
10-12	103	54	8	41	0				0			94	45	8	41	9	9	
10-13	83	35	13	35	0				0			77	29	13	35	6	6	
10-14	49	8	2	39	10		1	9	0			38	7	1	30	1	1	
10-15	14	1	0	13	0				0			13	0	0	13	1	1	
10-16	48	14	5	29	10	1	1	8	0			33	8	4	21	5	5	
10-17	36	11	5	20	1			1	0			24	0	5	19	11	11	
10-18	24	5	4	15	0				0			19	0	4	15	5	5	
10-19	70	21	12	37	3		1	2	0			56	10	11	35	11	11	
10-20	72	18	9	45	0				0			66	12	9	45	6	6	
10-21	186	97	29	60	19	2	8	9	0			136	66	19	51	31	29	2
10-22	359	199	45	115	24	3	5	16	0			317	178	40	99	18	18	
10-23	63	38	4	21	4	2		2	0			44	21	4	19	15	15	
10-24	86	43	7	36	6	2	2	2	0			79	40	5	34	1	1	
10-25	39	17	2	20	2			2	0			34	14	2	18	3	3	
10-27	18	5	2	11	0				0			17	4	2	11	1	1	
10-28	6	4	1	1	0				0			6	4	1	1	0		
10-29	23	5	3	15	1			1	0			21	4	3	14	1	1	
10-30	29	20	4	5	1			1	0			25	18	3	4	3	2	1
10-31	7	3	0	4	0				0			4	0	0	4	3	3	
OCT	2629	933	390	1306	170	12	40	118	0	0	0	2116	595	333	1188	343	326	17
CUM/OCT	3081	1068	516	1497	210	13	53	144	0	0	0	2391	601	437	1353	480	454	26
11-01	2	1	0	1	0				0			1			1	1	1	
11-06	2	1	1	0	0				0			1		1		1	1	
11-07	2	1	1	0	0				0			0				2	1	1
11-08	17	2	4	11	1			1	0			14		4	10	2	2	
11-09	46	25	5	16	0				0			32	11	5	16	14	14	
11-10	182	108	26	48	6		4	2	0			162	94	22	46	14	14	
11-11	182	111	18	53	14	1	5	8	0			157	99	13	45	11	11	
11-12	172	112	24	36	9		6	3	0			149	102	14	33	14	10	4
11-13	108	82	7	19	9	1	4	4	0			91	74	2	15	8	7	1
11-14	57	48	2	7	1	1			0			50	41	2	7	6	6	
11-15	63	56	2	5	2		1	1	0			52	47	1	4	9	9	
11-16	15	15	0	0	0				0			14	14			1	1	
11-17	t	11	0	1	0				0			11	10		1	1	1	
11-18	14	9	3	2	2	1	1		0			12	8	2	2	0		
11-19	14	13	0	1	2	2			0			12	11		1	0		

Appendix B-1. Continued

	TRAPPED				SAC/MORT				RELEASED UPSTREAM			RELEASED @ DAM				BROOD		
DATE	TOTAL	AD	JK	MJ	TOTAL	AD	JK	MJ	TOTAL	AD	JK	TOTAL	AD	JK	MJ	TOTAL	AD	JK
11-20	8	7	0	1	0				0			8	7		1	0		
11-21	21	15	3	3	3	2	1		0			18	13	2	3	0		
11-22	8	7	0	1	0				0			8	7		1	0		
11-24	12	10	1	1	0				0			12	10	1	1	0		
11-25	6	5	1	0	3	2	1		0			3	3			0		
NOV	931	639	98	206	52	10	23	19	0	0	0	807	551	69	187	84	78	6
CUM/NOV	4012	1707	614	1703	262	23	76	163	0	0	0	3198	1152	506	1540	564	532	32
12-06	1	0	1	0	0				0			1		1		0		
12-11	1	1	0	0	0				0			1	1			0		
12-13	1	0	1	0	0				0			1		1		0		
12-14	2	1	0	1	0				0			2	1		1	0		
12-15	4	3	0	1	0				0			4	3		1	0		
12-16	3	2	0	1	0				0			3	2		1	0		
12-17	3	0	0	3	0				0			3			3	0		
DEC	15	7	2	6	0	0	0	0	0	0	0	15	7	2	6	0	0	0
CUM/DEC	4027	1714	616	1709	262	23	76	163	0	0	0	3213	1159	508	1546	564	532	32
1-27	2	1	1	0	0				0			2	1	1		0		
1-30	1	1	0	0	0				0			1	1			0		
JAN	3	2	1	0	0	0	0	0	0	0	0	3	2	1	0	0	0	0
CUM/JAN	4030	1716	617	1709	262	23	76	163	0	0	0	3216	1161	509	1546	564	532	32
JAN	4033	1718	618	1709	0	0	0	0	0	0	0	3	2	1	0	0	0	0
CUM/JAN	4034	1719	618	1709	0	0	0	0	0	0	0	4	3	1	0	0	0	0

Appendix B-2. 2002 Coho Return Disposition

	TRAPPED			SAC/MORT			RELEASED UPSTREAM			RELEASED @ DAM			BROOD		
DATE	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK
9-03	1	0	1	0			0			1		1	0		
9-05	3	0	3	0			0			3		3	0		
9-06	1	0	1	0			0			1		1	0		
9-10	1	0	1	0			0			1		1	0		
9-11	4	1	3	1		1	0			3	1	2	0		
9-12	7	0	7	0			0			7		7	0		
9-13	8	0	8	0			0			8		8	0		
9-15	8	0	8	0			0			8		8	0		
9-16	11	0	11	3		3	0			8		8	0		
9-17	12	1	11	0			0			12	1	11	0		
9-18	7	0	7	0			0			7		7	0		
9-19	5	0	5	0			0			5		5	0		
9-20	9	1	8	0			0			9	1	8	0		
9-22	12	1	11	0			0			12	1	11	0		
9-23	5	1	4	0			0			5	1	4	0		
9-24	9	0	9	0			0			9		9	0		
9-25	5	1	4	0			0			5	1	4	0		
9-26	9	0	9	0			0			9		9	0		
9-27	13	0	13	1		1	0			12		12	0		
9-29	54	3	51	0			0			54	3	51	0		
9-30	11	0	11	3		3	0			8		8	0		
SEP	195	9	186	8	0	8	0	0	0	187	9	178	0	0	0
10-01	25	7	18	2		2	0			23	7	16	0		
10-02	30	9	21	3		3	0			27	9	18	0		
10-03	21	9	12	2		2	0			19	9	10	0		
10-04	21	7	14	1		1	0			20	7	13	0		
10-05	48	10	38	2		2	0			46	10	36	0		
10-06	22	7	15	1	1		0			21	6	15	0		
10-07	15	5	10	0			0			15	5	10	0		
10-08	27	4	23	4	1	3	0			23	3	20	0		
10-09	22	7	15	0			0			22	7	15	0		
10-10	18	1	17	3		3	0			15	1	14	0		
10-11	10	5	5	0			0			10	5	5	0		
10-12	8	2	6	0			0			8	2	6	0		
10-13	3	1	2	0			0			3	1	2	0		
10-14	4	1	3	1		1	0			3	1	2	0		
10-16	1	0	1	1		1	0			0			0		
10-17	6	4	2	0			0			6	4	2	0		
10-18	9	9	0	0			0			9	9		0		
10-19	13	11	2	0			0			13	11	2	0		
10-20	20	18	2	0			0			20	18	2	0		
10-21	82	69	13	11	10	1	0			71	59	12	0		
10-22	249	205	44	13	10	3	0			236	195	41	0		
10-23	94	62	32	2	2		0			92	60	32	0		
10-24	74	53	21	3	2	1	0			71	51	20	0		
10-25	20	19	1	1	1		0			19	18	1	0		
10-27	13	12	1	0			0			13	12	1	0		
10-28	4	4	0	1	1		0			3	3		0		
10-29	5	4	1	0			0			5	4	1	0		
10-30	29	24	5	1	1		0			28	23	5	0		
10-31	23	23	0	1	1		0			22	22		0		
OCT	916	592	324	53	30	23	0	0	0	863	562	301	0	0	0
CUM/OCT	1111	601	510	61	30	31	0	0	0	1050	571	479	0	0	0

Appendix B-2. Continued

	TRAPPED			SAC/MORT			RELEASED UPSTREAM			RELEASED @ DAM			BROOD		
DATE	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK
11-01	6	6	0	1	1		0			5	5		0		
11-04	1	1	0	0			0			1	1		0		
11-05	1	1	0	0			0			1	1		0		
11-06	1	1	0	0			0			1	1		0		
11-07	2	2	0	0			0			2	2		0		
11-08	22	21	1	2	2		0			20	19	1	0		
11-09	204	201	3	0			0			204	201	3	0		
11-10	1252	1166	86	45	43	2	0			1207	1123	84	0		
11-11	879	759	120	46	40	6	0			833	719	114	0		
11-12	367	278	89	6		6	0			361	278	83	0		
11-13	189	139	50	2		2	0			187	139	48	0		
11-14	165	131	34	4		4	0			161	131	30	0		
11-15	121	94	27	2		2	0			119	94	25	0		
11-16	46	38	8	0			0			46	38	8	0		
11-17	43	35	8	0			0			43	35	8	0		
11-18	20	13	7	3		3	0			17	13	4	0		
11-19	19	15	4	0			0			19	15	4	0		
11-20	34	32	2	0			0			34	32	2	0		
11-21	54	46	8	0			0			54	46	8	0		
11-22	53	47	6	0			0			53	47	6	0		
11-24	67	63	4	0			0			67	63	4	0		
11-25	14	12	2	0			0			14	12	2	0		
NOV	3560	3101	459	111	86	25	0	0	0	3449	3015	434	0	0	0
CUM/NOV	4671	3702	969	172	116	56	0	0	0	4499	3586	913	0	0	0
12-13	2	2	0	0			0			2	2		0		
12-14	29	29	0	0			0			29	29		0		
12-15	38	37	1	0			0			38	37	1	0		
12-16	35	34	1	0			0			35	34	1	0		
12-17	5	5	0	0			0			5	5		0		
12-18	5	5	0	0			0			5	5		0		
12-22	3	3	0	0			0			3	3		0		
DEC	117	115	2	0	0	0	0	0	0	117	115	2	0	0	0
CUM/DEC	4788	3817	971	172	116	56	0	0	0	4616	3701	915	0	0	0
1-02	2	2	0	0			0			2	2		0		
1-17	1	1	0	0			0			1	1		0		
JAN	3	3	0	0	0	0	0	0	0	3	3	0	0	0	0
CUM/JAN	4791	3820	971	172	116	56	0	0	0	4619	3704	915	0	0	0
JAN	4794	3823	971	172	116	56	0	0	0	4622	3707	915	0	0	0
CUM/JAN	4795	3824	971	172	116	56	0	0	0	4623	3708	915	0	0	0
2-05	0	0	0	0			0			0			0		
FEB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUM/FEB	4795	3824	971	172	116	56	0	0	0	4623	3708	915	0	0	0

Appendix B-3. 2002-2003 Summer Steelhead Return Disposition

	TRAPPED				SAC/MORT			RELEASED UPSTREAM			RELEASED @ DAM				BROOD		
DATE	TOTAL	UNK	H	W	TOTAL	H	W	TOTAL	H	W	TOTAL	UNK	H	W	TOTAL	H	W
6-12	2	0	1	1	0			2	1	1	0				0		
6-21	3	0	3	0	0			3	3		0				0		
JUN	5	0	4	1	0	0	0	5	4	1	0	0	0	0	0	0	0
7-08	1	0	0	1	0			1		1	0				0		
JUL	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0
CUM/JUL	6	0	4	2	0	0	0	6	4	2	0	0	0	0	0	0	0
8-20	1	0	0	1	0			0			1			1	0		
8-21	1	0	0	1	0			0			1			1	0		
8-26	1	0	1	0	0			0			1		1		0		
AUG	3	0	1	2	0	0	0	0	0	0	3	0	1	2	0	0	0
CUM/AUG	9	0	5	4	0	0	0	6	4	2	3	0	1	2	0	0	0
9-03	8	0	6	2	1	1		0			7		5	2	0		
9-05	1	0	0	1	0			0			1		0	1	0		
9-06	2	0	1	1	0			0			2		1	1	0		
9-11	8	0	6	2	0			0			8		6	2	0		
9-12	1	0	0	1	0			0			1			1	0		
9-15	3	0	1	2	0			0			3		1	2	0		
9-17	1	0	0	1	0			0			1			1	0		
9-18	6	0	4	2	1	1		0			5		3	2	0		
9-19	2	0	2	0	0			0			2		2		0		
9-20	1	0	1	0	0			0			1		1		0		
9-23	3	0	3	0	3	3		0			0				0		
9-24	1	0	1	0	1	1		0			0				0		
9-26	1	0	1	0	1	1		0			0				0		
9-27	2	0	0	2	0			0			2			2	0		
9-29	25	0	17	8	0			0			25		17	8	0		
9-30	4	0	4	0	3	3		0			1		1		0		
SEP	69	0	47	22	10	10	0	0	0	0	59	0	37	22	0	0	0
CUM/SEP	78	0	52	26	10	10	0	6	4	2	62	0	38	24	0	0	0
10-01	37	0	13	24	0			0			32		12	20	5	1	4
10-02	11	0	5	6	0			0			11		5	6	0		
10-03	6	0	3	3	1	1		0			3		2	1	2		2
10-04	9	0	5	4	0			0			9		5	4	0		
10-05	8	0	2	6	0			0			8		2	6	0		
10-06	10	0	2	8	0			0			10		2	8	0		
10-07	3	0	3	0	0			0			3		3		0		
10-08	10	0	2	8	2	1	1	0			4		1	3	4		4
10-09	3	0	3	0	0			0			3		3		0		
10-10	6	0	5	1	0			0			6		5	1	0		
10-11	15	0	7	8	1	1		0			10		5	5	4	1	3
10-12	10	0	2	8	0			0			10		2	8	0		
10-14	3	0	2	1	2	2		0			0				1		1
10-16	3	0	1	2	0			0			2		1	1	1		1
10-17	1	0	1	0	0			0			1		1		0		
10-18	1	0	1	0	0			0			1		1		0		
10-19	1	0	0	1	0			0			1			1	0		
10-20	3	0	2	1	0			0			3		2	1	0		
10-21	5	0	3	2	2	2		0			2		1	1	1		1
10-22	7	0	5	2	1	1		0			6		4	2	0		
10-23	1	0	0	1	0			0			1			1	0		
10-24	6	0	1	5	1	1		0			1			1	4		4
10-29	1	0	1	0	1	1		0			0				0		
10-30	4	0	3	1	1	1		0			3		2	1	0		
10-31	2	0	0	2	0			0			2			2	0		
OCT	166	0	72	94	12	11	1	0	0	0	132	0	59	73	22	2	20
CUM/OCT	244	0	124	120	22	21	1	6	4	2	194	0	97	97	22	2	20
11-01	2	0	0	2	0			0			2			2	0		
11-06	1	0	0	1	0			0			1			1	0		
11-08	5	0	2	3	0			0			5		2	3	0		
11-09	11	0	1	10	0			0			11		1	10	0		
11-10	16	0	4	12	1	1		0			15		3	12	0		
11-11	32	0	4	28	1	1		0			24		3	21	7		7
11-12	25	0	12	13	1	1		0			24		11	13	0		

Appendix B-3. Continued

	TRAPPED				SAC/MORT			RELEASED UPSTREAM			RELEASED @ DAM				BROOD		
DATE	TOTAL	UNK	H	W	TOTAL	H	W	TOTAL	H	W	TOTAL	UNK	H	W	TOTAL	H	W
11-13	18	0	4	14	2	2		0			16		2	14	0		
11-14	23	0	10	13	3	3		0			20		7	13	0		
11-15	21	0	8	13	2	2		0			19		6	13	0		
11-16	3	0	1	2	0			0			3		1	2	0		
11-17	3	0	2	1	0			0			3		2	1	0		
11-18	1	0	0	1	0			0			1			1	0		
11-19	5	0	0	5	0			0			5			5	0		
11-20	12	0	4	8	0			0			12		4	8	0		
11-21	7	0	5	2	0			0			7		5	2	0		
11-22	5	0	2	3	0			0			5		2	3	0		
11-24	4	0	4	0	0			0			4		4		0		
11-25	3	0	1	2	0			0			2			2	1	1	
NOV	197	0	64	133	10	10	0	0	0	0	179	0	53	126	8	1	7
CUM/NOV	441	0	188	253	32	31	1	6	4	2	373	0	150	223	30	3	27
12-07	1	0	0	1	0			0			1			1	0		
12-08	1	0	0	1	0			0			1			1	0		
12-14	3	0	0	3	0			0			3			3	0		
12-15	8	0	2	6	0			0			8		2	6	0		
12-16	20	0	4	16	0			0			16		3	13	4	1	3
12-17	17	0	5	12	0			0			17		5	12	0		
12-18	10	0	3	7	0			0			10		3	7	0		
12-19	8	0	3	5	0			0			8		3	5	0		
12-20	3	0	0	3	0			0			3			3	0		
12-22	3	0	1	2	0			0			3		1	2	0		
12-23	1	0	0	1	0			0			1			1	0		
12-24	3	0	2	1	0			0			3		2	1	0		
12-26	1	0	0	1	0			0			1			1	0		
12-28	2	0	1	1	0			0			2		1	1	0		
12-29	6	0	5	1	0			0			6		5	1	0		
12-30	5	0	1	4	0			0			5		1	4	0		
12-31	3	0	0	3	0			0			3			3	0		
DEC	95	0	27	68	0	0	0	0	0	0	91	0	26	65	4	1	3
CUM/DEC	536	0	215	321	32	31	1	6	4	2	464	0	176	288	34	4	30
1-02	30	0	5	25	0			0			30		5	25	0		
1-03	37	0	10	27	2	2		0			30		7	23	5	1	4
1-04	72	11	13	48	0			0			72	11	13	48	0		
1-05	56	18	5	33	0			0			56	18	5	33	0		
1-06	52	14	5	33	0			0			52	14	5	33	0		
1-07	21	2	3	16	0			0			21	2	3	16	0		
1-08	20	0	9	11	0			0			20		9	11	0		
1-09	17	1	7	9	0			0			17	1	7	9	0		
1-10	12	0	6	6	0			0			12		6	6	0		
1-11	6	0	0	6	0			0			6			6	0		
1-12	7	0	4	3	0			0			7		4	3	0		
1-13	12	0	3	9	0			0			10		3	7	2		2
1-14	16	0	6	10	0			0			16		6	10	0		
1-15	14	0	8	6	0			0			13		8	5	1		1
1-16	16	0	3	13	0			0			13		3	10	3		3
1-17	7	0	0	7	0			0			7		0	7	0		
1-18	5	0	1	4	0			0			5		1	4	0		
1-19	6	0	0	6	0			0			6			6	0		
1-20	5	0	0	5	0			0			5			5	0		
1-21	3	0	0	3	0			0			3			3	0		
1-22	2	0	0	2	0			0			2			2	0		
1-24	1	0	0	1	0			0			1			1	0		
1-25	4	0	2	2	0			0			4		2	2	0		
1-26	11	0	2	9	0			0			11		2	9	0		
1-27	16	0	6	10	3	3		0			13		3	10	0		
1-28	6	0	4	2	0			0			6		4	2	0		
1-30	62	0	11	51	4	4		0			51		6	45	7	1	6
JAN	516	46	113	357	9	9	0	0	0	0	489	46	102	341	18	2	16
CUM/JAN	1052	46	328	678	41	40	1	6	4	2	953	46	278	629	52	6	46

Appendix B-3. Continued

	TRAPPED				SAC/MORT			RELEASED UPSTREAM			RELEASED @ DAM				BROOD		
DATE	TOTAL	UNK	H	W	TOTAL	H	W	TOTAL	H	W	TOTAL	UNK	H	W	TOTAL	H	W
2-05	24	24	0	0	0			0			24	24			0		
2-06	55	47	3	5	0			0			55	47	3	5	0		
2-07	27	9	4	14	0			0			27	9	4	14	0		
2-08	42	9	7	26	0			0			42	9	7	26	0		
2-09	62	2	14	46	0			0			62	2	14	46	0		
2-10	86	0	19	67	4	4		0			78		15	63	4		4
2-11	91	0	20	71	8	8		0			83		12	71	0		
2-12	81	0	25	56	0			0			81		25	56	0		
2-13	108	0	22	86	0			0			104		22	82	4		4
2-14	58	0	14	44	0			0			58		14	44	0		
2-15	89	9	13	67	0			0			89	9	13	67	0		
2-16	88	7	17	64	0			0			88	7	17	64	0		
2-17	49	7	7	35	0			0			49	7	7	35	0		
2-18	44	29	2	13	0			0			44	29	2	13	0		
2-19	61	43	3	15	0			0			61	43	3	15	0		
2-20	4	3	0	1	0			0			4	3	0	1	0		
2-21	41	3	17	21	0			0			41	3	17	21	0		
2-22	74	0	28	46	0			0			74		28	46	0		
2-23	35	0	14	21	0			0			35		14	21	0		
2-24	21	0	4	17	0			0			15		4	11	6		6
2-25	3	0	0	3	0			0			3			3	0		
2-26	4	0	0	4	0			0			4			4	0		
2-28	10	0	3	7	0			0			10		3	7	0		
FEB	1157	192	236	729	12	12	0	0	0	0	1131	192	224	715	14	0	14
CUM/FEB	2209	238	564	1407	53	52	1	6	4	2	2084	238	502	1344	66	6	60
3-01	8	0	4	4	0			0			8		4	4	0		
3-02	5	0	3	2	0			0			5		3	2	0		
3-03	15	0	4	11	0			0			15		4	11	0		
3-04	27	0	8	19	0			0			27		8	19	0		
3-05	12	0	4	8	0			0			12		4	8	0		
3-06	18	0	6	12	0			0			18		6	12	0		
3-07	19	0	6	13	0			0			19		6	13	0		
3-08	33	0	7	26	0			0			33		7	26	0		
3-09	6	0	4	2	0			0			6		4	2	0		
3-10	35	0	15	20	2	2		0			28		13	15	5		5
3-11	54	0	22	32	4	4		0			46		17	29	4	1	3
3-12	23	0	11	12	3	3		0			20		8	12	0		
3-13	32	0	13	19	4	4		0			22		7	15	6	2	4
3-14	5	0	1	4	0			0			5		1	4	0		
3-19	8	8	0	0	0			0			8	8			0		
3-20	60	57	1	2	0			0			60	57	1	2	0		
3-21	48	35	6	7	0			0			48	35	6	7	0		
3-22	15	1	5	9	0			0			15	1	5	9	0		
3-23	16	1	10	5	0			0			16	1	10	5	0		
3-24	3	0	2	1	0			0			3		2	1	0		
3-25	27	0	8	19	2	2		0			19		6	13	6		6
3-22	0	0	0	0	0			0			0				0		
3-23	0	0	0	0	0			0			0				0		
3-26	48	0	20	28	2	2		0			38		18	20	8		8
3-27	26	0	10	16	0			0			26		10	16	0		
3-28	35	0	16	19	8	8		0			25		8	17	2		2
3-29	16	0	10	6	0			0			16		10	6	0		
3-30	18	0	9	9	0			0			18		9	9	0		
3-31	15	0	7	8	0			0			15		7	8	0		
MAR	627	102	212	313	25	25	0	0	0	0	571	102	184	285	31	3	28
CUM/MAR	2836	340	776	1720	78	77	1	6	4	2	2655	340	686	1629	97	9	88
4-01	15	0	9	6	0			0			15		9	6	0		
4-02	14	0	7	7	0			0			14		7	7	0		
4-03	25	0	11	14	0			0			25		11	14	0		
4-04	12	0	4	8	0			0			12		4	8	0		
4-05	12	0	4	8	0			0			12		4	8	0		
4-06	24	0	8	16	0			0			24		8	16	0		
4-07	12	0	5	7	0			0			12		5	7	0		
4-09	38	0	14	24	3	3		0			25		11	14	10		10

Appendix B-3. Continued

	TRAPPED				SAC/MORT			RELEASED UPSTREAM			RELEASED @ DAM				BROOD		
DATE	TOTAL	UNK	H	W	TOTAL	H	W	TOTAL	H	W	TOTAL	UNK	H	W	TOTAL	H	W
4-10	9	0	3	6	0			0			9		3	6	0		
4-11	23	0	4	19	1	1		0			20		3	17	2		2
4-12	10	0	3	7	0			0			10		3	7	0		
4-13	6	0	0	6	0			0			6		0	6	0		
4-14	4	1	0	3	0			0			4	1	0	3	0		
4-15	4	0	2	2	0			0			4		2	2	0		
4-16	3	0	0	3	0			0			3		0	3	0		
4-17	1	0	0	1	0			0			1		0	1	0		
4-18	1	0	0	1	0			0			1		0	1	0		
4-20	3	0	0	3	0			0			3		0	3	0		
4-21	6	0	1	5	0			0			6		1	5	0		
4-22	1	0	1	0	0			0			1		1	0	0		
4-23	4	0	0	4	0			0			4			4	0		
4-24	1	0	0	1	0			0			1			1	0		
4-26	1	0	0	1	0			0			1			1	0		
4-27	2	0	1	1	0			0			2		1	1	0		
4-28	4	0	1	3	1	1		0			3			3	0		
4-29	2	0	0	2	0			0			2			2	0		
APR	237	1	78	158	5	5	0	0	0	0	220	1	73	146	12	0	12
CUM/APR	3073	341	854	1878	83	82	1	6	4	2	2875	341	759	1775	109	9	100
5-02	3	0	0	3	0			0			3			3	0		
5-05	1	0	0	1	0			0			1			1	0		
5-06	2	0	0	2	0			0			2			2	0		
5-10	1	0	0	1	0			0			1			1	0		
MAY	7	0	0	7	0	0	0	0	0	0	7	0	0	7	0	0	0
CUM/MAY	3080	341	854	1885	83	82	1	6	4	2	2882	341	759	1782	109	9	100
5-07	0	0	0	0	0			0			0				0		
5-09	0	0	0	0	0			0			0				0		
5-10	109	0	9	100	0			0			0				109		
5-14	0	0	0	0	0			0			0				0		
5-21	0	0	0	0	0			0			0				0		
MAY	3199	341	863	1995	83	82	1	6	4	2	2892	341	759	1792	218	9	100
CUM/MAY	3200	341	863	1996	83	82	1	6	4	2	2893	341	759	1793	218	9	100
6-10	0	0	0	0	0			0			0				0		
6-08	0	0	0	0	0			0			0				0		
6-14	0	0	0	0	0			0			0				0		
6-27	0	0	0	0	0			0			0				0		
6-28	0	0	0	0	0			0			0				0		
6-29	0	0	0	0	0			0			0				0		
JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUM/JUN	3200	341	863	1996	83	82	1	6	4	2	2893	341	759	1793	218	9	100
7-05	0	0	0	0	0			0			0				0		
JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUM/JUL	3200	341	863	1996	83	82	1	6	4	2	2893	341	759	1793	218	9	100
JUL	3200	341	863	1996	83	82	1	6	4	2	2893	341	759	1793	218	9	100
CUM/JUL	3200	341	863	1996	83	82	1	6	4	2	2893	341	759	1793	218	9	100

Appendix B-4. 2003 Spring Chinook Return Disposition

	TRAPPED			SAC/MORT			RELEASED UPSTREAM			RELEASED @ DAM			BROOD		
DATE	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK
3-27	1	1	0	0			0			1	1		0		
3-30	1	1	0	0			0			1	1		0		
3-31	5	5	0	0			0			5	5		0		
MAR	7	7	0	0	0	0	0	0	0	7	7	0	0	0	0
4-01	6	6	0	0			0			6	6		0		
4-02	2	2	0	0			0			2	2		0		
4-03	3	3	0	0			0			3	3		0		
4-04	10	10	0	0			0			10	10		0		
4-05	6	6	0	0			0			6	6		0		
4-06	6	6	0	0			0			6	6		0		
4-07	1	1	0	0			0			1	1		0		
4-09	9	9	0	0			0			9	9		0		
4-10	5	5	0	0			0			5	5		0		
4-11	4	4	0	0			0			4	4		0		
4-12	47	47	0	0			0			47	47		0		
4-13	52	52	0	0			0			52	52		0		
4-14	26	26	0	0			0			26	26		0		
4-15	63	63	0	0			0			63	63		0		
4-16	70	70	0	0			0			70	70		0		
4-17	49	49	0	0			0			49	49		0		
4-18	49	49	0	0			0			49	49		0		
4-19	18	18	0	0			0			18	18		0		
4-20	35	35	0	0			0			35	35		0		
4-21	27	27	0	0			0			11	11		16	16	
4-22	42	42	0	1	1		0			10	10		31	31	
4-23	43	43	0	0			0			14	14		29	29	
4-24	40	40	0	0			0			26	26		14	14	
4-25	72	72	0	0			0			46	46		26	26	
4-26	117	117	0	0			0			117	117		0		
4-27	89	89	0	0			0			89	89		0		
4-28	82	82	0	1	1		0			45	45		36	36	
4-29	99	99	0	1	1		0			73	73		25	25	
4-30	124	124	0	0			0			124	124		0		
APR	1196	1196	0	3	3	0	0	0	0	1016	1016	0	177	177	0
CUM/APR	1203	1203	0	3	3	0	0	0	0	1023	1023	0	177	177	0
5-01	116	116	0	0			0			116	116		0		
5-02	98	98	0	0			0			98	98		0		
5-03	85	85	0	0			0			85	85		0		
5-04	71	71	0	0			0			71	71		0		
5-05	97	97	0	0			0			44	44		53	53	
5-06	133	133	0	0			0			49	49		84	84	
5-07	84	84	0	0			0			33	33		51	51	
5-08	85	85	0	1	1		0			44	44		40	40	
5-09	58	58	0	3	3		0			30	30		25	25	
5-10	84	80	4	5	5		0			61	57	4	18	18	
5-11	62	62	0	1	1		0			42	42		19	19	
5-12	104	103	1	2	1	1	0			49	49		53	53	
5-13	75	74	1	4	3	1	0			48	48		23	23	
5-14	71	69	2	0			0			47	46	1	24	23	1
5-15	107	107	0	0			0			86	86		21	21	
5-16	122	120	2	0			0			122	120	2	0		
5-17	110	109	1	0			0			110	109	1	0		
5-18	76	74	2	0			0			76	74	2	0		
5-19	52	52	0	0			0			38	38		14	14	
5-20	60	53	7	0			0			32	29	3	28	24	4
5-21	39	35	4	0			0			22	20	2	17	15	2

Appendix B-4. Continued

	TRAPPED			SAC/MORT			RELEASED UPSTREAM			RELEASED @ DAM			BROOD		
DATE	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK	TOTAL	AD	JK
5-22	36	35	1	1	1		0			21	21		14	13	1
5-23	22	21	1	0			0			10	10		12	11	1
5-24	31	30	1	1	1		0			14	13	1	16	16	
5-25	26	24	2	0			0			11	11		15	13	2
5-26	15	15	0	0			0			5	5		10	10	
5-27	34	27	7	0			0			11	10	1	23	17	6
5-28	22	14	8	1	1		0			2	2		19	11	8
5-29	33	25	8	0			0			17	12	5	16	13	3
5-30	11	7	4	1	1		0			5	2	3	5	4	1
MAY	2019	1963	56	20	18	2	0	0	0	1399	1374	25	600	571	29
CUM/MAY	3222	3166	56	23	21	2	0	0	0	2422	2397	25	777	748	29
6-01	18	12	6	0			0			7	1	6	11	11	
6-02	19	14	5	2	1	1	8	4	4	0			9	9	
6-03	48	36	12	5		5	20	13	7	0			23	23	
6-04	26	23	3	0			13	10	3	0			13	13	
6-05	28	27	1	0			7	6	1	0			21	21	
6-06	13	9	4	0			6	2	4	0			7	7	
6-08	17	14	3	0			9	6	3	0			8	8	
6-10	21	11	10	8		8	12	10	2	0			1	1	
6-11	20	18	2	0			20	18	2	0			0		
6-12	34	30	4	0			34	30	4	0			0		
6-13	21	16	5	4	2	2	17	14	3	0			0		
6-15	37	32	5	3	3		34	29	5	0			0		
6-16	40	31	9	3		3	37	31	6	0			0		
6-17	9	6	3	2		2	7	6	1	0			0		
6-18	6	5	1	0			6	5	1	0			0		
6-19	3	2	1	0			3	2	1	0			0		
6-22	96	94	2	3	1	2	93	93		0			0		
6-24	31	29	2	1		1	30	29	1	0			0		
6-26	10	10	0	0			10	10		0			0		
6-27	3	3	0	0			3	3		0			0		
6-30	6	5	1	1	1		5	4	1	0			0		
JUN	506	427	79	32	8	24	374	325	49	7	1	6	93	93	0
CUM/JUN	3728	3593	135	55	29	26	374	325	49	2429	2398	31	870	841	29
7-02	4	4	0	1	1		3	3		0			0		
7-03	1	1	0	0			1	1		0			0		
7-06	3	3	0	0			3	3		0			0		
JUL	8	8	0	1	1	0	7	7	0	0	0	0	0	0	0
CUM/JUL	3736	3601	135	56	30	26	381	332	49	2429	2398	31	870	841	29
8-22	1	1	0	0			1	1		0			0		
AUG	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0
CUM/AUG	3737	3602	135	56	30	26	382	333	49	2429	2398	31	870	841	29
9-01	1	1	0	0			1	1		0			0		
9-08	1	1	0	0			1	1		0			0		
9-11	1	1	0	0			1	1		0			0		
9-15	1	1	0	0			1	1		0			0		
9-29	1	1	0	0			1	1		0			0		
SEP	5	5	0	0	0	0	5	5	0	0	0	0	0	0	0
CUM/SEP	3742	3607	135	56	30	26	387	338	49	2429	2398	31	870	841	29

Appendix C. 2002 - 2003 Adult Transportation Summary

DATE	LOADING SITE	LOADING TEMP	RELEASE SITE	RELEASE TEMP	NUMBER HAULED	MORTS	LIBERATION UNIT
10/01/02	3MD	56	MINTHORN	55	5	0	TRAILER
10/03/02	3MD	55	MINTHORN	54	2	0	TRAILER
10/08/02	3MD	57	MINTHORN	55	4	0	TRAILER
10/11/02	3MD	54	MINTHORN	52	4	0	TRAILER
10/14/02	3MD	48	MINTHORN	51	1	0	TRAILER
10/16/02	3MD	49	MINTHORN	50	1	0	TRAILER
10/21/02	3MD	58	MINTHORN	52	1	0	TRAILER
10/24/02	3MD	53	MINTHORN	48	4	0	TRAILER
10/31/02	RINGOLD	57	YOAKUM	42	170	0	TANKER
11/01/02	RINGOLD	58	YOAKUM	42	180	0	TANKER
11/04/02	RINGOLD	56	YOAKUM	43	180	0	TANKER
11/05/02	RINGOLD	58	YOAKUM	43	180	3	TANKER
11/11/02	3MD	47	MINTHORN	52	7	0	TRAILER
11/15/02	RINGOLD	56	YOAKUM	45	149	1	TANKER
11/19/02	3MD	46	YOAKUM	48	122	0	TANKER
11/25/02	3MD	39	MINTHORN	46	1	0	TRAILER
12/16/02	3MD	47	MINTHORN	45	4	0	TRAILER
01/03/03	3MD	44	MINTHORN	48	5	0	TRAILER
01/13/03	3MD	40	MINTHORN	43	2	0	TRAILER
01/15/03	3MD	40	MINTHORN	43	1	0	TRAILER
01/16/03	3MD	41	MINTHORN	43	3	0	TRAILER
01/30/03	3MD	43	MINTHORN	41	7	0	TRAILER
02/10/03	3MD	40	MINTHORN	44	4	0	TRAILER
02/13/03	3MD	39	MINTHORN	44	4	0	TRAILER
02/24/03	3MD	39	MINTHORN	41	6	0	TRAILER
03/10/03	3MD	47	MINTHORN	48	5	0	TRAILER
03/11/03	3MD	47	MINTHORN	49	4	0	TRAILER
03/13/03	3MD	48	MINTHORN	48	6	0	TRAILER
03/25/03	3MD	47	MINTHORN	48	6	0	TRAILER
03/26/03	3MD	46	MINTHORN	47	8	0	TRAILER
03/28/03	3MD	45	MINTHORN	48	2	0	TRAILER
04/09/03	3MD	52	MINTHORN	49	10	0	TRAILER
04/11/03	3MD	53	MINTHORN	50	2	0	TRAILER
04/21/03	3MD	51	SFWW	47	16	0	TANKER
04/22/03	3MD	51	SFWW	43	31	0	TANKER
04/23/03	3MD	50	SFWW	46	29	0	TANKER
04/24/03	3MD	50	SFWW	43	14	0	TANKER
04/25/03	3MD	49	SFWW	44	26	0	TANKER
04/28/03	3MD	52	SFWW	45	36	0	TANKER
04/29/03	3MD	53	SFWW	46	25	0	TANKER
05/05/03	3MD	52	SFWW	45	53	0	TANKER
05/06/03	3MD	51	SFWW	44	84	0	TANKER
05/07/03	3MD	52	SFWW	42	51	0	TANKER
05/08/03	3MD	52	SFWW	45	40	0	TANKER
05/09/03	3MD	53	SFWW	47	25	0	TANKER
05/10/03	3MD	55	SFWW	47	18	0	TANKER
05/11/03	3MD	57	SFWW	45	18	0	TANKER
05/12/03	3MD	57	SFWW	45	53	0	TANKER
05/13/03	3MD	56	SFWW	49	23	0	TANKER
05/14/03	3MD	58	SFWW	48	24	0	TANKER
05/15/03	3MD	59	SFWW	49	21	0	TANKER
05/19/03	3MD	55	SFWW	48	14	0	TANKER
05/20/03	3MD	56	SFWW	46	28	0	TANKER
05/21/03	3MD	56	SFWW	46	17	0	TANKER
05/22/03	3MD	57	SFWW	49	14	0	TANKER
05/23/03	3MD	63	SFWW	52	12	0	TANKER
05/24/03	3MD	65	SFWW	52	16	0	TANKER
05/25/03	3MD	65	SFWW	45	15	0	TANKER
05/26/03	3MD	62	SFWW	48	10	0	TANKER
05/27/03	3MD	63	SFWW	48	23	0	TANKER
05/28/03	3MD	65	SFWW	49	19	0	TANKER
05/29/03	3MD	67	SFWW	53	16	0	TANKER
05/30/03	3MD	68	SFWW	48	5	1	FLATBED

If difference between loading and release temps are more than 10^0F tank is tempered to within 10^0F

Appendix C. (continued)

DATE	LOADING SITE	LOADING TEMP	RELEASE SITE	RELEASE TEMP	NUMBER HAULED	MORTS	LIBERATION UNIT
06/01/03	3MD	64	SFWW	49	11	0	FLATBED
06/02/03	Ringold	58	SFWW	50	21	0	FLATBED
06/02/03	3MD	66	HORNHOLLOV	58	8	0	TANKER
06/02/03	3MD	66	SFWW	50	9	0	TANKER
06/05/03	3MD	67	HORNHOLLOV	58	7	0	TANKER
06/05/03	3MD	67	SFWW	51	21	0	TANKER
06/06/03	3MD	68	HORNHOLLOV	58	6	0	TANKER
06/06/03	3MD	68	SFWW	51	7	0	TANKER
06/08/03	3MD	70	HORNHOLLOV	62	9	0	TANKER
06/08/03	3MD	70	SFWW	55	8	0	TANKER
06/10/03	3MD	68	HORNHOLLOV	62	12	0	TANKER
06/10/03	3MD	68	SFWW	52	1	0	TANKER
06/11/03	3MD	66	HORNHOLLOV	60	20	0	FLATBED
06/12/03	3MD	67	HORNHOLLOV	60	34	3	FLATBED
06/13/03	3MD	67	HORNHOLLOV	62	17	0	FLATBED
06/15/03	3MD	66	HORNHOLLOV	60	34	0	FLATBED
06/16/03	3MD	68	BEAR CR.	60	37	0	FLATBED
06/17/03	3MD	68	BEAR CR.	60	8	0	FLATBED
06/18/03	3MD	69	BEAR CR.	60	6	0	FLATBED
06/19/03	3MD	69	BEAR CR.	59	5	0	FLATBED
06/22/03	3MD	59	BEAR CR.	54	98	0	TANKER
06/24/03	3MD	63	BEAR CR.	54	39	0	TANKER
06/26/03	3MD	66	BEAR CR.	57	17	0	TANKER
06/27/03	3MD	70	BEAR CR.	62	5	0	TRAILER
06/30/03	3MD	70	BEAR CR.	62	7	0	TRAILER
07/02/03	3MD	65	BEAR CR.	62	3	0	TRAILER
07/03/03	3MD	67	BEAR CR.	58	3	0	TRAILER
07/06/03	3MD	70	HORNHOLLOV	73	4	0	TRAILER
08/07/03	SFWW	52	SFWWR	55	52	0	CTUIRTANKER
08/07/03	SFWW	52	SFWWR	55	92	0	ODFWTANKER
08/07/03	SFWW	54	SFWWR	55	77	0	CTUIRTANKER
08/07/03	SFWW	54	SFWWR	55	69	0	ODFWTANKER
08/22/03	3MD	68	BEAR CR.	59	1	0	TRAILER
08/27/03	3MD	64	BEAR CR.	59	1	0	TRAILER
09/01/03	3MD	63	BEAR CR.	54	1	0	TRAILER
09/08/03	3MD	61	BEAR CR.	51	1	0	TRAILER
09/11/03	3MD	63	BEAR CR.	53	1	0	TRAILER
09/15/03	3MD	60	BEAR CR.	55	1	0	TRAILER
09/29/03	3MD	60	BEAR CR.	50	1	0	TRAILER
If difference between loading and release temps are more than 10^0F tank is tempered to within 10^0F							
6/19/03	TRANSPORTED 1 ADULT LAMPREY TO BEAR CR.						

Appendix D. 2003 Juvenile Transportation Summary

DATE	LOADING SITE	LOADING TEMP	RELEASE SITE	RELEASE TEMP	POUNDS HAULED	LIBERATION UNIT
7/07/03	Westland	62	URBR	70	60	Trailer
7/09/03	Westland	64	URBR	71	40	Trailer
7/11/03	Westland	64	URBR	74	35	Trailer
7/14/03	Westland	65	URBR	72	30	Trailer
7/16/03	Westland	64	URBR	74	23	Trailer
7/18/03	Westland	65	URBR	74	17	Trailer

URBR - Umatilla River Boat Ramp

Appendix E

UMATILLA HATCHERY AND BASIN ANNUAL OPERATION PLAN

FOR THE PERIOD OF

OCTOBER 1, 2002 - SEPTEMBER 30, 2003

PREPARED BY:

OREGON DEPARTMENT OF FISH AND WILDLIFE

AND THE

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

FOR

BONNEVILLE POWER ADMINISTRATION

IPC Update
November 8, 2002

UMATILLA HATCHERY AND BASIN ANNUAL OPERATION PLAN
OCTOBER 1, 2002- SEPTEMBER 30, 2003
TABLE OF CONTENTS

I. INTRODUCTION

This document focuses on production at Umatilla Hatchery and on other hatcheries that produce fish for the Umatilla Subbasin. Additionally, since other subbasin operations such as passage and research are so closely tied to fish production issues, they are also covered.

Fish production was initiated at Umatilla Hatchery in 1991. Since that time, many design and construction problems have been resolved. However, well water shortage continues to be a problem at Umatilla Hatchery.

Monitoring and evaluation plans have been developed and are ongoing with current production plans. Chinook salmon and steelhead being released in the Umatilla basin will be tagged or marked according to monitoring and evaluation (M & E) requirements and for identification of strays into the Snake River basin.

A. Water Supply

Discussions of the water supply issues at Umatilla Hatchery have been discontinued until decisions on the proposed John Day Reservoir drawdown are made. Pumps for remote wells at Umatilla Hatchery have been sized to meet capacity.

B. Staffing

Oregon Department of Fish and Wildlife (ODFW) Umatilla Hatchery staff consists of one F&W Manager 1, one F&W Technician 2, four F&W Technician 1's, one Trades/Maintenance Worker 2, one half-time F&W Technician 1, and one Trades/Maintenance Worker 1. Liberation staff consistent of one 3-month F&W Technician 2 and F&W Technician 3.

C. Production Plan

The Power Planning Council's 1987 Fish and Wildlife Program authorized construction of a hatchery to produce 290,000 pounds of salmon and steelhead for release in the Umatilla River (Table 1). However, Umatilla Hatchery EIS limits production to 165,000 pounds. Because of water shortages at Umatilla Hatchery the original production plan for the facility has been revised (Table 2). Reviewers of this plan should note that the Umatilla Hatchery is operated under the Power Planning Council's system policies of adaptive management to determine production goals.

The fish production plan for Umatilla Hatchery is based on available water. When additional water becomes available, the production plan will be modified. Ideally, an additional 15,000 gpm of well water should be developed to meet production plans.

There are still concerns about hatchery fall chinook adults straying into other basins. The following steps have been taken to address these concerns; 1) all juveniles are being uniquely tagged, 2) collection facilities are in place on the Snake River to remove Umatilla stray fish, 3) Phase 1 and 2 of the Umatilla Basin Water Exchange Project are complete and in operation, and 4) smolts are either acclimated or released higher (mid-river) in the basin to improve imprinting to the Umatilla River.

D. Satellite Facilities

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) in conjunction with ODFW are currently operating five juvenile acclimation/release facilities and two adult holding and spawning facilities for spring and fall chinook, steelhead and coho.

A hatchery facility is also planned for construction on the South Fork Walla Walla River as identified in the draft Supplemental Umatilla Hatchery Master Plan. This facility is scheduled to produce approximately 515,000 yearling spring chinook smolts.

Table 1. Master plan proposed salmon and steelhead production at Umatilla hatchery with designated water flows.

Species	Stock	Rearing Type	Number	Pounds	FPP	Age	Release Time
ChS	Umatilla	Michigan	720,000	48,000	10	0+	Spring
ChS	Umatilla	Oregon	360,000	24,000	10 & 15	0+	Spring
ChS	Umatilla	Oregon	210,000	42,000	5	1+	Spring
	ChS Subtotal		1,290,000	114,000			
ChF	Upriver Brights	Michigan	4,320,000	72,000	60	0+	Spring
ChF	Upriver Brights	Michigan	1,620,000	27,000	60	0+	Spring
	ChF Subtotal		5,940,000	99,000			
StS	Umatilla	Michigan	210,000	42,000	5	1+	Spring
	Production Total		7,440,000	255,000			

Table 2. Proposed salmon and steelhead production at Umatilla hatchery with currently available water flow for release into the Umatilla River.

Species	Stock	Rearing Type	Number	Pounds	FPP	Age	Release Time
ChS	Umatilla	Oregon	210,000	14,000	15	1+	Spring
ChS	Umatilla	Michigan	250,000	16, 667	15	1+	Spring
	ChS Subtotal		460,000	30,667			
ChF	Upriver Brights	Michigan	300,000	6,000	50	0+	Spring
ChF	Upriver Brights	Michigan	300,000	8,570	35	0+	Spring
ChF	Lyons Ferry	Oregon	300,000	7,143	42	0+	Spring
	ChF Subtotal		900,000	14,500			
StS	Umatilla	Michigan	150,000	30,000	5	1+	Spring
	Production Total		1,510,000	126,810			

E. Fish Production Fiscal Year 2003

Table 3. Planned and actual production for the Umatilla Basin in Fiscal Year 2002 and 2003.

HATCHERY/SPECIES	**FY 2002** PLANNED	**FY 2002/a** ACTUAL	**FY 2003** PLANNED	FUNDING SOURCE
UMATILLA				
Fall Chinook Subyearlings	648K	621K	600K	BPA
Fall Chinook Sub-yearlings	NA	NA	300K	IPC
Spring Chinook Yearlings	512K	514K	460K	BPA
Summer Steelhead	152K	159K	125K	BPA
LITTLE WHITE SALMON				
Spring Chinook Yearlings	395K	365K	350K	BPA
BONNEVILLE				
Fall Chinook Yearlings	560K	521K	480K	COE
CASCADE				
Coho	998K	1081K	1.0M	NMFS
LOWER HERMAN CREEK				
Coho	479K	543K	500K	NMFS

/a FY 2002 actual numbers are numbers produced at hatcheries and do not reflect acclimation mortalities.
FY2003: ChS planned release of 810K

II. FACILITY OPERATIONS

A. Three Mile Dam Adult Collection Facility

The Three Mile Falls Dam (TMFD) fish ladder and adult collection trap will begin operations August 16 when the Umatilla Basin Water Exchange Project (Phase I operations) will begin to attract adults with flows downstream from TMFD. The trap will be operated to collect broodstock and run data daily until December 1, 2002. Beginning December 1, the TMFD adult fish trap will be operated five days on and nine days off.

Trap and Haul will be implemented if the passage flow criteria of 150 cfs for 30 days after release cannot be met or if physical passage conditions are unacceptable at Feed Canal Dam. Trap and Haul will not be implemented unless special conditions arise.

When the adult collection trap is not being operated, CTUIR will video record and count adult salmon and steelhead and jack salmon moving past the viewing window. Run data (sex ratios, age classes and wild vs. hatchery) for video counts will be estimated and marks recorded when visibility permits. Fish viewed when conditions are not adequate to view marks will be classified as “unknown”. It is not expected that all fish will be classified for marks.

B. Westland Juvenile Collection Facility

The Westland juvenile collection facility will be operated when the passage flow is below 150 cfs for ten days downstream of Westland Dam. As flows continue to decline and river begins to dewater, practical efforts will be made to block downstream migration to prevent stranding. All fish collected at the Westland juvenile trap will be loaded into a fish transportation tanker and released at the mouth of the Umatilla River.

C. McKay Reservoir Releases For Fish Passage/Rearing

Stored water in McKay Reservoir (designated for fish flow augmentation and made available through the Umatilla Basin Water Exchange project) will be released by priority (Table 4). Time periods and priorities may change for the spring and summer of 2003 depending on availability of water.

Table 4. Prioritized time periods for the release of fish flow augmentation water from McKay Reservoir.

Time Period	Flow (cfs)	Primary Release Purpose (Species/Life History)	Release Priority
Spring - July 10	150	CHS Adults CHF Juv. Outmigration Lamprey Adults	1
July 11 - Sept 10	50	Lamprey Adults Coho, STS, Lamprey, Juv. Rearing CHF Juv. Outmigration	3
Sept 11 - Nov 15	150	Coho, CHF, STS Adults	2

NOTES:

- Targets are for area from mouth of McKay Creek to mouth of Umatilla River with the expected low flow point below Dillon Dam.
- Targets are not exact. We will attempt to maximize or exceed targets depending on storage availability (release priority 3 particularly depends on storage availability).
- We desire to maintain some quantity and timing flexibility before more in-season facts are known (natural flows, storage balance, temperatures, etc.).
- The above recommendations should be viewed as guidelines only due to uncertainty in water availability from year to year.
- There are numerous additional aquatic community and species/life history benefits associated with recommended releases beyond those listed in the “primary release purpose” column.

III. SUMMER STEELHEAD

A. 2002 Brood

1. **Smolt Goals/Rearing/Liberations –**The Umatilla Hatchery summer steelhead production goal is 150,000 smolts; however, production for BY02 is estimated at 125,000 fish.

In October 2002, approximately 125,200 fish will be adipose (AD) fin clipped and

transferred to three raceway sections (A, B, C) within one Michigan series. Fish will be loaded evenly at approximately 41,733 fish per section. In November 2002, three groups of 20,000 fish (one group per section) will be left ventral (LV) fin clipped and coded wire tagged (CWT). Each section represents a release group. Release sites include: Bonifer (C), Minthorn (B), and Pendleton (A).

The C-section will be transferred to Bonifer in early March 2003 and released in early April 2003. The other two groups, Minthorn (B-pond) and Pendleton (A-pond), will be transferred in early April and released in late April. All groups will be held for approximately two to three weeks, released volitionally for one week, and then forced out. The target size is 4.5 to 5.0 fpp.

B. 2003 Brood

1. Expected Run Size – 4,242 ± 577 (3,665 – 4,819)

2. Fish Disposition – A target of 120 CWT adult fish will be collected for CWT recovery. Fish will be collected according to the schedule in Table 5. This total will include the 10 CWT fish taken for broodstock, fish sacrificed at Three Mile Dam, and CWT fish sampled during creel surveys. Snouts will be collected and appropriate data will be recorded including sex, length, and fin marks. Scales will be collected from unmarked adults used for broodstock. Carcasses will be distributed by CTUIR.

From April 1 to July 15, if passage conditions or passage flow criteria cannot be met, all steelhead will be hauled upstream and released, alternating release sites whenever possible. Data will be collected on all fish released upstream including sex, fin marks and age class. Age classes will be divided between S1 (<26") and S2 (26" and larger).

3. Broodstock/Egg Collection - The broodstock goal is 110 adults (100 wild).

Broodstock will be collected at Three Mile Dam from September through April (Table 5). Fifty unmarked females, fifty unmarked males, and 10 CWT males will be collected. Each fish will be anesthetized with CO2. Fish will be transferred to Minthorn for holding and spawning.

Spawning will be conducted at Minthorn. A 3x3 spawning matrix will be utilized whenever possible. Matrices will select for wild x wild crosses whenever possible, however, hatchery males may be used. Males will be used only once. CWT's from all hatchery fish will be read prior to spawning. Fish determined to be out-of-basin strays will not be used for broodstock. Approximately 201,000 green eggs will be collected from 38 females (fecundity 5,289) and transferred to Umatilla Hatchery.

Fungus on adults will be controlled with Hydrogen Peroxide treatments three to five days per week beginning in February. Eggs will be treated with formalin to control fungus. The use of formalin is under a veterinary prescription.

Table 5. Collection guidelines for summer steelhead broodstock and CWT sacrifices (5-year average).

	Total	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Broodstock – Wild	100	7	13	9	9	13	10	27	12
Broodstock - Hatchery	10	1	1	1	1	1	1	3	1
CWT sacrifice	110	8	13	10	12	14	10	31	12

4. Smolt Goals/Rearing/Liberations – The Umatilla Hatchery summer steelhead production goal is 150,000 smolts.

Approximately 164,000 eyed eggs will produce an estimated 156,600 swim-up fry in July. Fry will be ponded in two Canadian troughs. In July and August, the fish will be split into six Canadian troughs at approximately 750 fpp. In August at 330 fpp, they will be moved outside to one Oregon raceway. In late September at 90fpp, they will be AD clipped and split into two Oregon raceways. In late October, fish will be split evenly into three sections within one Michigan series. In early November, about 20,000 fish will be LV fin clipped and CWT. Smolts will be transferred in 2004, Bonifer facility in early March and Minthorn and Pendleton facilities in early April. Fish will be approximately 4.5 and 5.0 fpp at release.

IV. SPRING CHINOOK

A. 2001 Brood

1. Smolt Goals/Rearing/Liberations - The BY2001 Umatilla subbasin spring chinook yearling production goal is 810,000 smolts. This production consists of 460,000 from Umatilla Hatchery and 350,000 smolts from Little White Salmon Hatchery (LWSH). ***Umatilla -*** All spring chinook reared at Umatilla Hatchery will be acclimated at Imeques C-mem-ini-kem acclimation facility (RM 80). All production will be marked with an AD fin clip and 160,000 will be marked with an additional RVCWT. Final loading will be 105,000 in two Oregon series (52,500 fish in four sections) and 250,000 in two Michigan series (50,000 fish in five sections).

One Oregon series (105,000) will be transferred to Imeques in mid-November at 15 fpp and released in mid-March at approximately 15 fpp. This mid-November transfer is a continuation of a cold-water acclimation experiment by hatchery M&E.

The remaining 355,000 fish (2-Michigan and 1-Oregon series) will be transferred in mid-January and released in mid-March at approximately 15 fpp. Each acclimation group will be volitionally released for one week before a forced release.

Little White--Spring chinook reared at Little White will be acclimated at Imeques after the Umatilla production has been released. Fish will be marked with an Ad fin clip and 40,000 will be marked ADRVCWT. Production of 350,000 smolts will be in five raceways (70,000 per raceway).

Fish will be transferred in mid-March for acclimation and released into the Umatilla River in mid-April 2003 at approximately 15 fpp**.** Each group will be allowed to volitionally leave the ponds for one week before a forced release.

B. 2002 Brood

1. Broodstock/Egg Collection - Eggs for the Umatilla basin spring chinook program will be taken from the 560 adults (1:1 sex ratio) collected from adults and jacks at TMFD and transferred to the South Fork Walla Walla facility. Adults were collected from April through June with the peak collection in May. Approximately 560 fish are needed to meet production goals with a pre-spawning mortality of 3.6% (540 fish).

An estimated total of 1.08 million green eggs can be collected from 270 females spawned (fecundity @4,000). Fertilized eggs will be transferred and incubated at the Umatilla Hatchery. After eggs have reached the eyed stage, a total of 367,000 eggs will be transferred to Little White Salmon Hatchery. The remaining embryos will be reared at Umatilla Hatchery.

Eggs may be culled and smolts may be segregated following ELISA examinations. Co-managers will consult to make decisions on culling and segregation once ELISA results are obtained. The overall goal is to only use eggs from females with OD values <0.200.

2. **Smolt Goals/Rearing/Liberations -** The BY2002 Umatilla Basin spring chinook yearling production goal is 810,000 smolts, 460,000 smolts at Umatilla and 350,000 smolts at Little White Salmon Hatchery.

Umatilla--In mid May 2003, approximately 477,000 fry will be placed in Canadian troughs. These fish will be transferred to one Oregon pond in June 2003. In July 2003, 467,000 (98% survival from ponding) will be split into two Oregon series (233,730 fish each). One 28-day erythromycin feed treatment is scheduled for early summer 2003. All production will be AD clipped. CWT fish will have ADLV fin clips. In late July or early August 2003, about 20,000 fish will be implanted with a CWT, LV marked, split into four Oregon sections (two Oregon series) and six Michigan sections (two Michigan series). Final loading will be 52,500 in each of four Oregon sections (two Oregon series) and 50,000 in each of five Michigan sections (two Michigan series). One Oregon series or two sections (105,000) will be transferred to one acclimation pond at Imeques in mid-November at 15 fpp. These fish will be released in mid March at approximately 15 fpp. The remaining fish (355,000) will be transferred to Imeques for acclimation in mid January and will be released in the Umatilla River in mid March 2004, at approximately 15 fpp. Liberation will include one week of volitional releases before being forced out.

LWSH--The BY2002 Little White Salmon Hatchery spring chinook yearling production goal is 350,000 smolts. Production will occur in 5 new raceways (3,850 $ft.^3$ per raceway @ DI = 0.2) loaded with approximately 70,000 fish per raceway. One 21-day erythromycin feed treatment is scheduled in early summer 2003.

All fish will be AD clipped. In addition to AD clips, about 40,000 will be implanted with a CWT and LV marked. Fish will be transferred to Imeques (RM 80) in mid-March 2004 for acclimation and released in mid-April 2004. Smolts will be approximately 15 fpp.

C. 2003 Brood

1. Expected Run Size – 4,983 ± 881 (4,102 – 5,864)

2. Fish Disposition –Adults with CWT, recognizable by ventral fin clip, will be collected from spawning ground surveys, broodstock, and fisheries. Snouts will be removed and bio-data will be recorded such as sex, length and fin marks. All CWT marked jacks not taken for brood and mini-jacks will be sacrificed. Scales will be taken as needed for the natural production estimates.

If passage conditions or passage flow criteria cannot be met from April 1 to July 15, fish will be hauled upstream and released at the Pendleton Boat Ramp (RM 52.5) or Pendleton acclimation facility (RM 56). If flows at Pendleton drop below 250 cfs, fish will be released as high in the basin as possible within ODFW fish liberation temperature criteria. When fisheries are opened, release sites will be agreed upon by ODFW and CTUIR. Whenever possible, release sites will be alternated. Data will be collected on all

fish released upstream including sex and marks.

3. Broodstock/Egg Collection - Broodstock for Umatilla River spring chinook production will be collected at Three Mile Dam based on the guidelines outlined in Table 6. If it is anticipated that the number of returning adults is not adequate to collect 560 adults, other locations where Carson stock is available, such as Ringold or LWSH, maybe used. Jacks will be incorporated into the broodstock at a rate of 1 for every 10 adult males. When possible, CWT adults and jacks will be collected for broodstock. Chinook collected at Three Mile Dam will be transferred to the South Fork Walla Walla facility for holding and spawning.

Table 6. Collection guidelines for spring chinook broodstock.

Total	Apr. 15-30	May 1 –15	May 16-31	June 1-15	June 16-30	July1-15
560 (adults)	96	210	186	53	15	0
28 (jacks)	0	3	15	8	2	0

Adults kept for spawning at the South Fork Walla Walla facility will be injected with oxytetracycline and erythromycin upon sorting at the TMFD. A second injection of each antibiotic will be given in mid July at the South Fork facility. Prescriptions for using oxytetracycline, erythromycin, and formalin treatments will be developed by CTUIR, ODFW, and a local veterinarian. Formalin treatments will be administered as needed (three to five days per week).

Eggs may be culled and fish segregated due to BKD screening examinations of females with OD values <0.200. A co-managers decision will determine numbers.

Minimum goals--In years when the projected returns are not adequate to collect 550 adults, other locations where Carson stock is available will be used. In years of low adult returns, the priority for production is Umatilla Hatchery. Collection rates at TMFD will also be adjusted to collect 70 females (140 total) to produce a minimum green egg number of 280,000 (210,000 yearling smolts).

Ongoing Discussion—The CTUIR and ODFW are exploring the possibility of releasing spring chinook adults returning to the Umatilla River into Walla Walla River.

4. Smolt Goals - The Umatilla Hatchery spring chinook production goal is 460,000 spring-release smolts scheduled for acclimation at Imeques C-mem-ini-kem (RM 80) from November 2004 through mid-March 2005.

The Little White Salmon Hatchery spring chinook production goal for the Umatilla River is 350,000 spring-release smolts to be acclimated at Imeques from mid-March through mid-April 2005.

V. FALL CHINOOK

The fall chinook production (1.08 million) is divided in two programs, yearling and subyearling. Yearlings (480,000) are produced at Bonneville Hatchery from adults returning to the TMFD. Subyearlings (600,000) are produced at Umatilla Hatchery from adults returning to Priest Rapids.

The Umatilla Hatchery program was reduced from 2.68 million to 600,000 fish in 2001. The reduction in subyearlings was implemented to evaluate survival rates of from different release strategies in the Umatilla River. This reduction has created unused space at Umatilla

Hatchery. Idaho Power Company has requested that ODFW rear 300,000 BY2002 sub-yearling fall chinook for release into the Snake River below Hells Canyon Dam in 2003. Production will not effect Umatilla River Sub-basin releases.

A. 2001 Brood

1. Smolt Goals/Rearing/Liberations - The Bonneville Hatchery John Day mitigation fall chinook production goal for the Umatilla River is 480,000 yearling smolts. Expected production is 480,000 fish.

Adult broodstock were collected and spawned at TMFD. Embryos are incubated to the eyed stage at Umatilla Hatchery, transferred and reared at Bonneville Hatchery. All production will be implanted with a wire tag, 430,000 with a blank wire tag (BWT) and 50,000 with a CWT. All CWT fish are externally marked with AD clip.

Smolts will be released in two groups from Thornhollow (RM 73.5). The first 240,000 fish group will be transferred in mid-February and released in mid-March 2003. The second 240,000 fish group will be transferred in mid-March (after the first group has been released) and released in mid-April 2003. Each group will be volitionally released for one week and then forced out. Target size is 10 fpp.

B. 2002 Brood

1. Expected Run Size – 917 ± 193 (724 –1,110)

2. Fish Disposition - All CWT adults and jacks trapped and not taken for broodstock will be sacrificed. Snouts will be collected and appropriate data will be recorded including sex, length and fin marks. All unmarked fish will be checked for blank wire tags. Age classes will be divided between mini-jacks (<15.75"), jacks (15.75" - <24") and adults (24" and larger). Carcasses will be distributed by CTUIR. CWT marked mini-jacks will be sampled at 20 fish per week, if available. Scales will be taken as needed for the natural production estimates.

Up to 1,000 fall chinook may be transferred from Ringold or Priest Rapids Hatchery to the Umatilla River above TMFD to augment natural production. These fish will be released at Yoakum or the Pendleton facility.

3. Broodstock/Egg Collection - Fall chinook broodstock will be collected at TMFD and Priest Rapids. Other sources may include Bonneville and Little White Salmon hatcheries. Egg source priorities will be in the preceding order, depending on egg availability. Umatilla Hatchery needs to receive 670,000 eyed eggs from Priest Rapids Hatchery. Bonneville Hatchery needs 560,000 eyed eggs collected from TMFD.

Broodstock will be collected at TMFD at an initial rate of 100% of the total adult return by trapping period up to a maximum of 470 adults and at a male to female ratio of approximately 1:1. Jacks will be incorporated into the broodstock at a rate of one for every 10 adult males. As many CWT adults and jacks as possible will be included in the broodstock. The broodstock collection rate will be adjusted as necessary (fecundity @ 3,800) to provide 692,000 green eggs and 560,000 eyed eggs (480,000 yearling smolts).

Formalin treatments (three to five days per week) will be used for fungus control under a veterinary prescription. Hydrogen peroxide will be used as needed if a veterinary prescription is not obtained. CTUIR, ODFW, and a local veterinarian will develop a

prescription for use of oxytetracycline and erythromycin to control furunculosis and BKD. All non-ripe fish arriving prior to November 4th will be injected with oxytetracycline and erythromycin. New arrivals after November 4th do not need to be injected.

4. Subyearling and Yearling Goals/Rearing/Liberations -

Subyearling- The Umatilla Hatchery fall chinook subyearling production goal is 600,000. Swim-up should occur about mid-February 2003. Approximately 625,000 swim-up fry will be placed in one Oregon pond. In mid March, the fish will be split into two Michigan ponds. Marking of 600,000 subyearlings for the Umatilla program will begin the first week of April and will be completed by May 1. In April, all fish will be implanted with CWT and AD marked in four distinct and equal groups. Final rearing will be in four Oregon ponds to evaluate two release strategies.

Strategy 1 --Two groups of approximately 150,000 each will be transferred to Thornhollow acclimation ponds in early May at approximately 50 fpp, held for two weeks, volitionally released for one week, and forced out in late May 2003.

Strategy 2 -- The remaining two groups of 150,000 each will be released directly into the Umatilla River at Reith (RM 48) in late May 2003. Target size at release is 35 fpp. Release time into the Umatilla River is dependent on river flows and temperatures. If temperatures allow, fish will be direct released at night. Contingency for high water temperatures is an early morning release with tempered water.

Yearling-The Bonneville Hatchery John Day mitigation fall chinook yearling production goal for the Umatilla River is 480,000 smolts.

All fish will be marked including 430,000 BWT and 50,000 ADCWT. All fish will be acclimated at Thornhollow (RM 73.5). The early group of 240,000 fish will be transferred to Thornhollow in mid-February for acclimation and released in mid-March 2004. The late group of 240,000 fish will be transferred in mid-March for acclimation and released in mid-April 2004. Both groups will be volitionally released for one week before forced out. Target size in both groups is 10 fpp.

5. Idaho Power Company—Subyearling/Goals/Rearing/Liberations -

Subyearling- The Umatilla Hatchery fall chinook sub-yearling production goal is 300,000 for transfer and release into the Snake River below Hells Canyon Dam. Swim-up should occur about mid-February 2003. Approximately 312,500 swim-up fry will be placed in one Oregon pond. In mid March, the fish will be moved to one Michigan ponds. Marking of 300,000 subyearlings for the Umatilla program will begin the in late April and will be completed by early May. In April, all fish will be ad clipped and 10,000 will be implanted with PIT. Final rearing will be in two Oregon ponds. Target size is 42 fpp. Transfers and liberations is the responsibility of Idaho Power Company.

VI. COHO

A. 2001 Brood

1. Smolt Goals/Rearing/Liberations - The Coho production goal for the Umatilla River is 1,500,000 smolts. Production is divided between two facilities; one million smolts are produced at Cascade Hatchery, and half million are produced for Lower Herman Pond (Oxbow hatchery). Fish are acclimated in two time frame periods. Both periods acclimate 750,000 smolts.

Cascade Hatchery—Smolts will be released in two groups from the Pendleton

acclimation facility (RM 56). Each group will be represented with a 25,000 AdCWT mark. The first group (250,000 fish) will be transferred in mid-February and released in mid-March 2003. The second group (750,000 fish) will be transferred in mid-March (after the first group has been released) and released in mid-April 2003. During the second acclimation period, three ponds (approximately 562,500 fish) will be volitional released for one week prior to forced release. The other pond (approximately 187,000 fish) will be force released in early April, at the same time the volitional release is started. This forced release creates space for steelhead acclimations. Target size is approximately 15 fpp.

Lower Herman Creek Pond—Production will be transferred and released as one group. This group is represented with a 25,000 AdCWT mark. All fish (500,000) will be transferred in mid-February and released in mid-March at approximately 15 fpp. These fish will be volitionally released for one week and then forced out.

B. 2002 Brood

1. Expected Run Size – 1,460 (936 - 2,233)

2. Fish Disposition -- One hundred AdCWT adults will be sacrificed across the run. It is anticipated that all AdCWT fish collected will need to be sacrificed. Co-managers will consult on the collection rate if the numbers vary from what is anticipated. All AdCWT jacks will be sacrificed. Snouts will be collected and appropriate data will be recorded including sex, length, and fin marks. Carcasses will be distributed by CTUIR.

All remaining unmarked adults and jacks will be released at Three Mile Dam regardless of stream flow. Data will be collected on fish released upstream including sex and age class. Age classes will be divided between jacks (< 18") and adults (18" and larger).

3. Broodstock/Egg Collection – Broodstock will be collected, held and spawned at Bonneville Hatchery. Green eggs will be transported to Cascade Hatchery for incubation and rearing. If additional adults are needed to meet production goals, adults can be collected, held and spawned at TMFD.

4. Smolt Goals/Rearing/Liberations - The Cascade Hatchery coho production goal for the Umatilla River is 1,000,000 smolts.

Of these fish, two groups of 25,000 will be ADCWT. In mid February 2004, 250,000 fish (one 25K AdCWT marked group) will be transferred to the Pendleton acclimation facility (RM 56) and released into the Umatilla River in mid-March at approximately 15 fpp. Volitional release will occur for one week before fish are forced out. The remaining 750,000 fish (one 25K AdCWT marked group) will be transferred to the Pendleton (RM 56) acclimation facility in mid-March. Three ponds (approximately 562,500 fish) will be released in mid-April at approximately 15 fpp. Volitional release will occur for one week before fish are forced out. One pond (approximately 187,000 fish) will be forced released in early April, at the same time the volitional release is started on the other three ponds. The target size is 15 fpp.

An additional 500,000 coho (25,000 AdCWT) from Lower Herman Creek Pond will be transferred to the Pendleton (RM 56) acclimation facility in mid-February for release in the Umatilla River in mid-March at approximately 15 fish per pound. These fish will be volitionally released for one week and then forced out.

VII. HATCHERY MONITORING AND EVALUATION

A. Steelhead

1. Umatilla Hatchery/2002 brood- Determine and compare rearing performance, smolt condition, juvenile migration performance, and smolt-to-adult survival of steelhead reared in Michigan raceways. Lengths (300), weights (100), smolt conditions, and descaling (100) will be sampled from fish at transfer to and release from acclimation raceways. Each of the three groups will be acclimated and released from Bonifer Springs, Minthorn, or Pendleton facilities. To determine juvenile migration performance to TMFD, John Day and Bonneville Dams we will PIT-tag 300 fish per raceway. To determine smolt-to-adult survival we will ADLV+CWT mark 20,000 fish in each of three raceways. All remaining fish will be marked AD.

B. Spring chinook salmon

1. Umatilla Hatchery, 2001 brood yearlings- Determine and compare rearing performance, smolt condition, juvenile migration performance, and smolt-to-adult survival of yearling spring chinook salmon reared in Michigan and Oregon raceways. Lengths (300), weights (100), smolt conditions, and descaling (100) will be sampled from fish at transfer to and release from acclimation raceways. To determine migration performance and cold-water rearing we will PIT-tag 300 fish from two Oregon raceways (600 total) in October 2002 and transfer them to Imeques acclimation facilities. Additional groups of 300 will be PIT-tagged in three Michigan races and two Oregon raceways in January 2003. To determine smolt-to-adult survival we will mark 20,000 fish with ADLVCWT in three Michigan and four Oregon races. All remaining production will be AD clipped.

2. Little White Salmon Hatchery, 2001 brood yearlings-Determine and compare smolt condition, juvenile migration performance, and smolt-to-adult survival of yearling spring chinook salmon. Fish will be sampled at the acclimation ponds for length, weight, and smolt condition. To determine performance we will PIT tag two groups of 300 fish (LWS). To determine smolt-to-adult survival we will mark AD+LV+CWT two groups of 16,000 and 24,000 fish (LWS). All remaining production will be AD clipped.

C. Fall chinook salmon

1. Umatilla Hatchery, 2002 brood subyearlings- Determine and compare rearing performance, smolt condition, juvenile migration performance, and smolt-to-adult survival between subyearling fall chinook salmon reared in Oregon raceways and acclimated for one month and those directly released into the Umatilla River. Lengths (300), weights (100), smolt conditions, and descaling (100) will be sampled from fish at transfer to and release from acclimation raceways.

To determine juvenile migration performance we will PIT tag 300 fish in each of four Oregon sections in May 2003. To determine smolt-to-adult survival we will mark ADCWT 100% of the production.

1. **Bonneville Hatchery, 2000 brood yearlings-** Determine and compare smolt condition, juvenile migration performance, and smolt-to-adult survival of yearling fall

chinook salmon. Lengths (300), weights (100), smolt conditions, and descaling (100) will be sampled from fish at transfer to and release from acclimation raceways. To determine juvenile migration performance we will PIT tag two groups of 300 fish at Thornhollow acclimation facility. To determine smolt-to-adult survival groups of 28,000 fish will be marked ADCWT. All remaining fish will be marked BWT.

D. **All broods-**Determine and compare smolt-to-adult survival, fishery contribution, straying, relative survival to TMFD, and life history characteristics of all rearing and release strategies from groups at Umatilla, Bonneville, Little White Salmon and Willard Hatcheries. Acquire CWT recovery information from all freshwater and marine locations, sport and commercial fisheries, and adult returns to the Umatilla River. Table 7 presents the CWT and PIT tagging plan for hatchery monitoring and evaluation and outmigration studies for fish released in 2003.

Table 7. Summary of tagging for hatchery M&E and outmigration studies for fish released in 2003.

Species/ strategy	System or Hatchery	Number raceway	Total number	Number CWT	Number BWT	Tagging Date	Number PIT-tag	PIT-tag Date	Release Date	Study
Steelhead	Michigan	3	150K	60K (3x20K)	0	Nov 02	1200	Jan 03	March and April 03	Production & Release Strategy
	Michigan	1					500	Apr 03	Apr and May 03	Trap efficiency
Spring chinook Yearling	Michigan	5	150K	100K (5x20K)	0	Jul 02	1,500	Jan 03	March 03	Production
	Oregon	2	105K	40K (2x20K)	0	Jul 02	600	Jan 03	March 03	Production & Control
	Oregon	2	105K	40K (2x20K)	0	Jul 02	600	Oct 02	March 03	Cold-water Acclimation
	Little White Salmon	5	350K	40K (2x20K)	0	Mar 02	600	Feb 03	April 03	Production
Fall Chinook Subyearling	Oregon	4	600K	600 (4x150K)	0	Apr 03	1200	May 03	May 03	Release Strategy Outmigration
Subyearling Optional	Oregon	1					2700	June 03	June and July 03	Trap and Haul Evaluation
Yearling	Bonneville	8	500K	50K (2x25K)	410K	Aug 02	600	Feb 03	March and April 03	Rearing Strategy
						Total 6,300				

VIII. JUVENILE SALMONID OUTMIGRATION AND SURVIVAL STUDIES (ODFW)

The project will evaluate the outmigration and survival of natural and hatchery juvenile salmonids in the lower Umatilla River optimizing fisheries restoration program and enhancing our understanding of fish behavior in relation to river flow and passage facility operations.

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Objective 1: Conduct PIT-tag interrogation operations at West Extension Canal.

Task 1.1 Operate a remote interrogation system at the sampling facility at West Extension

Canal at TMFD to interrogate tagged fish; automatically upload interrogation files.
Task 1.2 Edit and submit tagging and monitor (hand) files to PTAGIS.
Task 1.3 Extract and analyze PIT-tag summary reports from PTAGIS database.

Objective 2: Design and implement PIT-tag interrogation capabilities at Three Mile Falls Dam ladder facility.

Task 2.1 Consult with experts to design an interrogation system for the east-bank ladder at TMFD (2003).
Task 2.2 Install an adult interrogation system at the east-bank ladder (2002/2003).
Task 2.3 Operate the east-bank interrogation system for adult and juvenile detection (2002/2003).

Objective 3: Determine migrant abundance, migration timing, and in-basin survival of PIT-tagged juvenile salmonids representing various hatchery rearing, release, and acclimation strategies.

Task 3.1 Assist with tagging production and test groups at Umatilla Hatchery.
Task 3.2 Conduct trap efficiency tests for tagged production groups at RM 3.7.
Task 3.3 Tag hatchery coho at acclimation ponds.
Task 3.4 Actively and passively interrogate tagged hatchery salmonids to estimate abundance, in-basin survival, and migration parameters.

Objective 4: Evaluate relative survival between transported and non-transported (in-river) tagged subyearling migrants.

Task 4.1 Tag and release subyearling fall chinook upriver for treatment (transported) and control (in-river) tests in July.
Task 4.2 Obtain tag detections of treatment and control fish at mainstem dams to determine differences in minimum survival.

Objective 5: Determine migration timing and abundance of tagged natural fish, and monitor trends in natural production of salmon, steelhead, and Pacific lamprey.

Task 5.1 Actively monitor natural salmonid and Pacific lamprey migrants at RM 1.2, using the rotary-screw trap, and at the sampling facility at West Extension Canal (RM 3.7).
Task 5.2 Conduct trap efficiency tests for tagged groups of natural salmonids at RM 3.7.
Task 5.3 Expand tagging of natural summer steelhead to supplement upriver tagging by CTUIR for estimation of smolt-to-adult survival.
Task 5.4 Assist with fall/winter fyke-net trapping of juvenile lamprey by CTUIR in the lower river (RM 0.5).
Task 5.5 Actively and passively interrogate tagged natural salmonids to estimate

abundance, tagged fish survival, and determine migration parameters.

Objective 6: Assess condition, health, size, and growth of hatchery and natural migrants.

Task 6.1 Examine subsamples of hatchery and natural fish for condition.

Appendix Table 7. Matrix of PIT tag and photonic color marks on returning salmon and steelhead released in prior years. Return years are for 2001 and 2002.

Fall Chinook – 2001	**Age at Return**				
Release Yr.	2	3	4	5	6
1996					0+
1997				0+(color)	1+(color)
1998			0+(400kHz/color)	1+(400kHz/color)	
1999		0+(400kHz)	1+(400kHz)		
2000	0+(134kHz)	1+(134kHz)			
2001	1+(134kHz)				

Fall Chinook – 2002	**Age at Return**				
Release Yr.	2	3	4	5	6
1997					0+(color)
1998				0+(400kHz/color)	1+(400kHz/color)
1999			0+(400kHz)	1+(400kHz)	
2000		0+(134kHz)	1+(134kHz)		
2001	0+(134kHz)	1+(134kHz)			
2002	1+(134kHz)				

Spring Chinook – 2001	**Age at Return**			
Release Yr.	2	3	4	5
1998				1+(400kHz/color)
1999			1+(400kHz)	
2000		1+(134kHz)		
2001	1+(134kHz)			

Spring Chinook – 2002	**Age at Return**			
Release Yr.	2	3	4	5

1999				1+(400kHz)	
2000			1+(134kHz)		
2001		1+(134kHz)			
2002	1+(134kHz)				

Summer Steelhead 2001-2002	**Age at Return**	
Release Yr.	1salt	2salt
1999		1+(400kHz)
2000	1+(134kHz)	

Colors:	**CHS**	**CHF**	**CHF0**	**STS**	**COH**
1997 anal fin (no tag)	dark green	red, orange	dk orange, pink blue	orange, red dk yellow	yellow
1998 anal fin (PIT tagged)	blue, yellow pink, green	blue	blue, yellow, green, pink	blue, yellow, red pink,orange,purp green, dk yellow	
dorsal fin (no tag)	orange	pink	dark yellow		green,orange, pink

Task 6.2 Preserve mortalities of natural fish and of diseased hatchery fish for examination by pathology staff.

Task 6.3 Measure lengths of tagged and untagged hatchery and natural fish.

Task 6.4 Sample scales from natural migrants for determination of age, growth, and life history characteristics by CTUIR.

Objective 7: Investigate effects of river, canal, and fishway operations, and environmental conditions on fish migration and survival.

Task 7.1 Measure river turbidity; obtain thermograph and flow data from cooperating agencies.

Task 7.2 Analyze fish migration parameters with river variables.

Task 7.3 Determine affect of canal and fishway operations and flow enhancement strategies on anadromous and resident fish behavior at Three Mile Falls Dam.

Objective 8: Document temporal distribution and diversity of resident fish species at trap sites.

Task 8.1 Identify and count resident fish species.

Task 8.2 Measure representative samples of resident fish lengths.

IX. NATURAL PRODUCTION EVALUATION (CTUIR)

A. Monitor natural spawning of hatchery and natural adult spring chinook, fall chinook and coho salmon, and summer steelhead in the Umatilla River Basin.

B. Monitor the migration and survival of naturally produced juvenile salmon and steelhead from Umatilla River spawning grounds to John Day and Bonneville Dams with PIT tags.

C. Estimate juvenile salmonid abundance and densities at index sites and selected reaches in the Umatilla River Basin.

D. Estimate tribal harvest of adult salmon and steelhead returning to the Umatilla River Basin.

E. Help Monitor temperatures in the Umatilla River Basin with other agencies.

F. Determine age, growth and life history characteristics of bull trout, salmon and steelhead in the Umatilla River Basin.

X. FISH PATHOLOGY AND FISH HEALTH MONITORING (ODFW)

A. Summer Steelhead

1. 2002 Brood Umatilla Hatchery Juveniles - Monthly monitoring and pre-liberation examinations as defined in the Umatilla Hatchery Fish Health Monitoring and Evaluation (FHME) work statement. The scope of these activities will be contingent upon personnel and funding levels. All activities will be by the ODFW La Grande Fish Pathology staff.

2. 2003 Brood Minthorn Pond Adults - Cooperative sampling for brood stock monitoring between CTUIR fisheries staff and ODFW La Grande Fish Pathology staff. On the first spawning day at Minthorn, La Grande staff will be present to provide sampling supplies and guidance on procedures for collecting samples. CTUIR fisheries staff may be requested to do sampling on some subsequent spawning days if ODFW staff are not available. The scope of these activities will be contingent upon funding levels.

Hydrogen peroxide treatments will be administered for fungus control three to five days per week beginning in February under protocols developed and implemented by CTUIR and ODFW personnel. Formalin treatments will be used if label requirements can be met. This would require DEQ approval and a veterinary prescription cooperatively developed by ODFW, CTUIR, and a local veterinarian. The CTUIR fishery staff will document and save all adult mortality for pathology to examine.

B. Spring Chinook

1. 2001 Brood Umatilla Hatchery Yearlings - Monthly monitoring and pre-liberation examinations at Umatilla Hatchery as defined in the Umatilla Hatchery FHME work statement. For fish transferred to Imeques C-mem-ini-kem on about November 1, 2001 for rearing until spring release, monthly monitoring and pre-liberation examinations will follow the same protocols as for Umatilla Hatchery. A pre-liberation examination will also be required for acclimated groups at Imeques in March and April of 2003. The scope of these activities will be contingent upon funding levels. All activities will be by the ODFW La Grande Fish Pathology staff.

2. 2001 Brood Little White Salmon Yearlings - Monthly monitoring and pre-transfer examinations by USFWS Lower Columbia River Fish Health Center (LCRFHC) staff. Monthly monitoring and pre-transfer fish health examinations reports will be provided to La Grande Fish Pathology prior to fish being transferred to the Umatilla River. Monthly monitoring will be by standard protocols used by the LCRFHC. A pre-liberation examination will also be required for acclimated groups at Imeques in March and April of 2003. This will by done by the ODFW La Grande Fish Pathology staff.

3. 2002 Brood Umatilla Hatchery Yearlings - Monthly monitoring as defined in the Umatilla Hatchery FHME work statement. The scope of these activities will be contingent upon personnel and funding levels. All activities will be by the ODFW La Grande Fish Pathology staff.

4. 2002 Brood Little White Salmon NFH Yearlings (Umatilla R. stock) - Monthly monitoring and pre-transfer examinations by USFWS Lower Columbia River Fish Health Center (LCRFHC) staff. Monthly monitoring and pre-transfer fish health examinations reports will be provided to La Grande Fish Pathology prior to fish being transferred to the Umatilla River. Monthly monitoring will be by standard protocols used by the LCRFHC.

5. 2003 Brood South Fork Walla Walla Facility Adults - Brood stock monitoring on spawned adults as defined in the Umatilla Hatchery FHME work statement. The scope of these activities will be contingent upon funding levels. Activities will be by the ODFW La Grande Fish Pathology staff and at times some assistance from CTUIR fisheries staff may be requested. All spawned females will be sampled for *R. salmoninarum.* This will allow segregation of eggs and progeny from high level *R. salmoninarum* antigen females from low level antigen females. The overall goal will be to only use eggs from females with OD values <0.200. Any eggs to be reared at USFWS hatcheries must be from ELISA-tested females. Eggs from females with O.D. values >0.499 will not be transferred to USFWS hatcheries.

Prescriptions for using oxytetracycline and erythromycin injections at Three Mile Dam and South Fork Walla Walla facilities will be cooperatively developed by ODFW, CTUIR, and a local veterinarian. A prescription for formalin treatments at the south Fork facility will also be cooperatively developed.

Monitoring of pre-spawning mortality for systemic bacteria, including *Renibacterium salmoninarum* will be by ODFW La Grande Fish Pathology staff on either fresh or frozen carcasses. CTUIR fisheries staff will document and save all needed carcasses

6. 2003 Brood Umatilla (SFWW) – La Grande Fish Health personnel will screen adult for *R. salmoninarum*. Eggs and fry may be segregated based into low and high groups on screening results. The goal is to use eggs from females with titers below 0.2. USFWS hatcheries will only accept eggs from ELISA-tested females below $\leq$ 0.499 OD levels. In the event that other brood is used for production, the BKD screening will be conducted from the egg collection hatchery using standard protocols developed by the responsible laboratory.

C. Fall Chinook

1. 2001 Brood Bonneville Hatchery Yearlings - Monthly monitoring and pre-liberation examinations by ODFW Fish Pathology staff. There are no special requirements for those fish destined for the Umatilla River. Monitoring will be by standard protocols used by the ODFW. A pre-liberation examination will also be required for acclimated groups at Thornhollow in March of 2003. ODFW La Grande Fish Pathology staff will do examinations.

2. 2002 Brood Umatilla Hatchery Sub-yearlings - Monthly monitoring and pre-liberation examinations as defined in the Umatilla Hatchery FHME work statement. The scope of these activities will be contingent upon funding levels. All activities will be by

the ODFW La Grande Fish Pathology staff.

3. 2002 Brood Bonneville Hatchery Yearlings - Monthly monitoring by ODFW Fish Pathology staff**.** There are no special requirements for those fish destined for the Umatilla River. Monitoring will be by standard protocols used by the ODFW.

5. Idaho Power Company-2002 Brood Lyons Ferry Sub-yearlings – Eyed eggs from 175 females tested low (>0.2 titers) for BKD can be transferred to Umatilla Hatchery in mid-December 2002 from Lyons Ferry Hatchery. Eggs will be disinfected with 100-ppm iodophore for minimum of 15 minutes. Females will also be sub-sampled for viral pathogens. Sub-yearling will be monitored and thoroughly examined 45 days prior to release as defined in the Idaho Power Company work statement. All activities will be by the ODFW La Grande Fish Pathology staff.

6. 2002 Brood Three Mile Falls Dam Facility Adults - Brood stock monitoring as defined in the Umatilla Hatchery FHME work statement. The scope of these activities will be contingent upon funding levels. Activities will be by the ODFW La Grande Fish Pathology staff and at times some assistance from CTUIR fisheries staff may be requested.

If possible a formalin prescription will be obtained. A prescription would require DEQ approval and a prescription developed by CTUIR, ODFW, and a local veterinarian. Hydrogen peroxide will be used if a veterinary prescription is not obtained. A prescription to use oxytetracycline and erythromycin by injections will be developed by ODFW, CTUIR, and local veterinarian.

Pre-spawning mortality will examined for systemic bacteria, including *R. salmoninarum,* by ODFW La Grande Fish Pathology staff on either fresh or frozen carcasses. CTUIR staff will document and save all needed carcasses.

7. 2002 Brood Priest Rapids Hatchery Adults - Brood stock monitoring by WDFW fish health staff. Monitoring will be by standard protocols used by the WDFW.

8. 2002 Bonneville Hatchery Adults - Brood stock monitoring by ODFW Fish Pathology staff. Monitoring will be by standard protocols used by the ODFW.

D. Coho

1. 2001 Brood Cascade Hatchery and Lower Herman Creek Pond Yearlings - Monthly and pre-liberation monitoring by ODFW Fish Pathology staff. There are no special requirements for those fish destined for the Umatilla River. Monitoring will be by standard protocols used by the ODFW. Pre-liberation examinations will also be required for two acclimated groups at the Pendleton (RM 56) in March and April of 2002. ODFW La Grande Fish Pathology staff will do these.

2. 2002 Brood Cascade Hatchery Adults - Brood stock monitoring by ODFW Fish Pathology staff. There are no special requirements for those adults providing gametes to produce progeny destined for the Umatilla River. Monitoring will be by standard protocols used by the ODFW.